

JPRS 75562

24 April 1980

East Europe Report

ECONOMIC AND INDUSTRIAL AFFAIRS

No. 2001

FBIS

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DEVELOPMENTS IN MINING, EXTRACTION INDUSTRY

Tirana TEKNIKA in Albanian No 4, Oct-Nov-Dec 79, p 1-5

[Article by Rexhep Shehu, deputy minister of industry and mines: "The Road of Successes of the Extraction and Processing Heavy Industry"]

[Text] The successes achieved in the socialist industrialization of the country during these 35 years of the people's government are a great victory of the party policy in the building of socialism, relying on its own forces. The party, implementing the teachings of Marxism-Leninism, from the first years after the liberation of the country, set forth the task for an uninterrupted development of socialist industrialization in order to remove the country from the great century-old backwardness by building a complex industry, capable of processing the natural resources and, first of all, the mineral raw materials, with great effectiveness. The Albanian Workers Party headed by Comrade Enver Hoxha, knew from the beginning that socialist industrialization constituted a necessity, a decisive link for preserving and consolidating the victories of the revolution, for the successful building of socialism in Albania. As the leading branch of the economy, industry sets the tone for all development; it constitutes the powerful technical and technological base that promotes the great and rapid paces of development of the economy in the country.

"The movement of our country from a backward technical-economic and semi-feudal situation directly to the building of socialism, passing over the phase of developed industrial capitalization," Comrade Enver Hoxha emphasized, "assigned to our party, as one of the most vital and urgent tasks, the creation of industry, through the socialist industrialization and electrification of the country."*

Evaluating it as such, the Albanian Workers Party treated the socialist industrialization of the country in its totality, as a political, ideological, economic and social problem. The Party developed a correct policy for the industrialization of the country; it executed it and is executing it with success.

*Enver Hoxha, Works, Volume 20, p 121.

Today, looking down from the great heights on which the party has elevated our fatherland during these 35 years of struggle against and of victories over the foreign and domestic enemies and the blockades of the imperialists and the revisionists of all hues--the Yugoslav, Soviet, Chinese and other revisionists--we contemplate the magnificent results of the policy of our party in the socialist industrialization of the country.

These successes have converted Albania into an economically powerful country with an unbreakable defense, and into a developed agricultural and industrial country with modern techniques and technology, a country which progresses with confidence on the road of its transformation into an industrial-agricultural country.

In its policy of socialist industrialization, implementing the teachings of Marxism-Leninism, the party has always given priority to the extraction and processing heavy industry, as a requirement by law for the building of socialism and for promoting the proletarian revolution.

In our five-year plans for the development of the economy, priority has been given to the sectors of heavy industry and, especially to those sectors of the petroleum, gas and mining industries, in comparison with the other branches of the economy. The particular attention of the party and the great investments, which were made, made it possible to stimulate geological prospecting, to discover petroleum and gas reserves and other useful ores for supporting the rapid development of the extraction and processing industries, based on the mining resources of the country, and to build a complete new and complex heavy industry. The extraction and processing heavy industry is in a position to play its leading role in the expanded socialist reproduction; it has become a powerful support for the development of the other branches of industry and, in general, of the economy.

The many-sided, uninterrupted and independent development of the extraction and processing industry is linked, first of all, with learning about, prospecting for, discovering and supplying petroleum and gas reserves and other useful minerals. Our experience in the building of socialism proves that without the supplying of combustible raw materials and electric power and without a powerful base of useful and solid minerals, it is not possible to guarantee the rapid and complex development of the economy. Therefore, immediately after the liberation of the country, particular attention was given to the creation and strengthening of our geological services and to the expansion and invigoration of geological research in order to provide, in the shortest time possible, petroleum, gas coal, copper, ferronickel reserves and so forth.

In its congresses, the party clearly set forth the guidelines and ways on the basis of which geological research activities for petroleum, gas and solid minerals have been developed.

From a country, where geological services did not exist, where the potential of the mineral-rich areas was not known and where only some small and inadequately studied resources of petroleum, coal, copper and chrome were known,

geological studies and research work took a great impulse and expansion from one five-year plan to the other five-year plan. Thus, the physical volumes of drilling-research works for petroleum and gas in the Sixth Five-Year Plan are seven times greater than in the First Five-Year Plan, and for useful solid minerals, for the same period, they are 40 times greater. The Puke enterprise alone today carries out, within a year, as many drillings as were carried out for the prospectings of useful solid minerals during the entire First Five-Year Plan; no comparison can be made with the pre-liberation period. Good results have been achieved in the knowledge of the geological construction and the potential of the mineral-rich areas of the country. Compared to six minerals that were known and worked in the First Five-Year Plan, in the Sixth Five-Year work is carried out for the research and discovery of industrial and geological reserves in 37 useful minerals. Considerable industrial and geological reserves of petroleum, gas, coal, chrome, copper, ferronickel, nickel-silicate, phosphorites, construction materials, raw materials for refractory materials and so forth, have been discovered. The number of mineral-rich areas, known and discovered in 1979, is greater, compared to 1960, as follows: petroleum and gas, 2 times; chrome ores, 4 times; copper ores, 8 times; coal, 4 times; ferronickel, 4 times; and so forth.

These successes were achieved in the fierce struggle against the foreign and domestic enemies--from the Yugoslav and Soviet revisionists down to the Chinese revisionists--who tried to disorient our geological prospectings, to convince us about the lack of prospects in our land for petroleum, gas, phosphorites, bauxites, polymetals, asbestos, precious metals and so forth, and to limit and to dim the prospects for chrome, copper, coal and other metals. The clear, foresighted and consistent line of the party, in regard to geological prospecting, made it possible, in contradiction with the conclusions of the Soviet revisionist specialists and of others, to discover mineral reserves in the areas which were considered as being without any prospects. Thus, we found petroleum in limestone soil; chrome ores in Bulqize, Bater and Theken and in other places; copper ores in the zone of Spac, Qaf-Bari, Qaf Mali, Gjegjan and so forth; coal in the areas of Tirana, Memaliaj and Moker; ferronickel and nickel-silicate in some zones in the districts of Librazhd, Pogradec, Korce, Kukes and so forth; and zones containing phosphorites, bauxites and asbestos were also discovered.

New horizons and an unprecedented impulse were given to the geological research work by the historical decisions of the Seventh Congress of the Albanian Workers Party and of the Sixth Five-Year Plan. During this five-year plan, the further expansion and strengthening of geological research work was drawn up for the known minerals and for new minerals. The physical volumes of operations has undergone a noticeable increase both for petroleum and gas and for the solid minerals. Thus, 31 percent more drilling and prospecting work than during the past five-year plan will be carried out for petroleum and gas; while, 70 percent more geological drilling work will be done for the solid minerals; 23 percent more tunnels will be opened; and 26 percent more other works will be done; thus, discovering more industrial and geological reserves than in any five-year plan. Geological prospecting operations with the exception of the known mineral-rich areas and zones, have been extended

to the zones relatively less known and less studied, as well as to greater depths. In order to improve the effectiveness of mineral workings, noticeable improvements have been made in strengthening technical and scientific discipline; the complexity of geological, geophysical and geochemical methods has been expanded and improved; and the evaluation of the zones in regard to the minerals which they hold, and the complex evaluation of the minerals in regard to all the accompanying elements, are being done better, and so forth. The results achieved during the years of Sixth Five-Year Plan in providing industrial and geological reserves, and the good prospects that have been opened up, are a guarantee that the tasks of the Sixth Five-Year Plan will be fulfilled and that the tasks for certain minerals will be overfulfilled. In this way, a further improvement of the balance-sheet of the known and new reserves of useful minerals will be reached, in order to guarantee rapid development of the extraction and processing industries in the coming five-year plan.

The discovery of reserves of useful minerals of petroleum and gas, chrome, ferronickel and coal and so forth become a powerful and reliable support for the rapid and continuing development of the extraction industry.

The extraction industry inherited some small mines from the past; a small petroleum-rich area under exploitation, a small copper mine, two small coal mines, some small outlets where chrome extraction was carried out, and a small bitumen mine. We can say that these mines did not constitute a mineral industry in the true meaning of the word. In these mines, with a small production, there existed a cruel exploitation in the interest of the foreign capital that controlled them. Today, we have a developed and well equipped industry for the extraction of minerals; it gives a large production; it is mechanized and has a technical level in harmony with the requirements of the times.

For the needs of the processing industry and for exports, in addition to petroleum, gas, coal, chrome, copper and bitumen, we extract ferronickel, pyrite, phosphorites, magnesites, quartz, dolomites and kaolins, and building materials such as clay and sand for bricks, marble, and volcanic glass and so forth. Today, 23 minerals are being exploited, compared to six that were exploited in the First Five-Year Plan. In the near future, mines for the extraction of ores of nickel-silicate, bauxites, polymetals, asbestos and titanomagnetite will be added to the mineral industry.

The extraction of petroleum and gas has been increased continuously not only to satisfy the needs of the country with by-products, but also to make a noticeable contribution to exports. The base for petroleum extraction during the 35 years of the people's government has been the oil-rich areas discovered by our oil workers. Today, the quantity of petroleum extracted from the oil-rich areas inherited from the past represents only 0.25 percent of the total quantity produced, while, compared to 1960, petroleum extraction has been increased more than twice.

The continuous increase of petroleum extraction is not only the result of the discovery of new oil-rich areas, but also the result of the execution of an advanced technology, placing the working of the mining site on scientific bases.

As a result of a continuing technical and scientific work, the intensifying methods of extraction have been increased in quality and in quantity from year to year, experiments have been carried out and the industrial implementation of the second methods has begun; new technological processes for the utilization of viscose naphtha and of deep wells have been assimilated--a thing that guarantees not only the rational exploitation of the oil-rich area, but also the increased quantity extracted from it which, in fact, is the main aim of extraction workers.

Although, we had no experience at all, after the 1960's, completely with our own forces, we discovered gas and condensate-gas rich areas in depths and in relatively great pressures, and also the technology of the utilization of these mineral-rich areas was very rapidly assimilated, especially in the studies and the preparation of blueprints for the working of mineral-rich areas and of their practical execution, solving many difficult problems in the technology of utilization and in the system of collection, especially of the condensate-gas, and in transportation to consumers. The results achieved in the extraction of gas, especially of condensate-gas, are a guarantee that, in the future, this important and essential sector, in the present condition of development, will always be expanding.

Now, complete branches of the mineral industry have been properly and clearly crystallized. These include the coal, chrome, copper and ferronickel sectors and so forth, which, because of their specific proportion and because of the revenues they provide, hold an important place in our socialist economy. Today, on the 35th anniversary of the liberation of the fatherland, we extract ores from about 60 mines, compared to six mines that we had in 1944. The place of the mine which used to be exploited in an artisan way, without mechanization and with a very small production, has been taken by mines with large production and with mechanisms of the latest technical progress. Today, we have mines, such as the "Todo Manco" chrome mine in Bulqize which, because of its reserves and because of its yields, is aligned with the largest mines in the world. The new technology has been introduced in our mines; the methods of exploitation have been perfected; and, today, these methods, which have advanced technical and economic indicators and which are of great economic advantage, are being implemented. Various types of machinery and equipment, which replace the heavy work done by hand, are being used in our mines. Today, for the exploitation of minerals in depth, there are 35 wells in operation, which have been designed and constructed with our own forces.

Seen from this vantage point, one can see better and more clearly, the great merit of our party which, with farsightedness, correctly evaluated the capacity of the mineral-rich areas of the country and, with intelligence and persistence, correctly stipulated the development of the heavy industry in general and of the mineral industry in particular, establishing ever increasing tasks for all the kinds of minerals, such as chrome, copper, coal, ferronickel and bitumen down to salt and stones, kaoline, quartz sands and so forth, which became the support for the creation and development of many other processing branches.

The rates of increase of the extraction of minerals in our country cannot be compared with the period before the liberation. It is enough to mention that in 1979, the 1938 production of coal is achieved in less than 1 day, the production of chrome ores in 2.7 days and the production of copper ores (compared to 1946) in less than 4 days and so forth. The increases in mineral production have made it possible for our country to be known in the world as a country with a developed mineral industry. According to 1977 statistical data, Albania holds the third place in the world for the extraction of chrome ores and, according to 1976 statistical data, Albania holds the 14th place in the production of nickel, ahead of countries such as Finland, the German Democratic Republic, Brazil, Poland and many other countries which also are known as main nickel producing countries. While, for copper production, Albania holds the 31st place among 61 main producing countries, ahead of countries such as Bolivia, Portugal, Morocco, Brazil, the Federal Republic of Germany, Italy and so forth, the countries which are also known as countries with important copper production.

The mineral industry in our country took on an even greater development after the 1960's. During this period, a great step forward was made--not only a quantitative step, but also a qualitative step--by the putting into operation of dozens of new mines and the increases of the production capacity of the existing mines. These measures, taken immediately after the Fourth Congress brought a further increase in the production of minerals.

At the Fifth Congress and Sixth Congress, in harmony with the stage of development of the country, the party assigned great priority tasks to the mineral industry for the increase of products, as well as important qualitative tasks, for the purpose of increasing the production of minerals for the development of the processing industry in the country and further increasing the export of minerals and of their products.

The results came one after the other. Compared to 1960, in 1975, when the fierce blockade of the Soviet revisionists was started, overall industrial production increased by 3.2 times; the production of the petroleum and chrome industries, 3.1 times; that of the copper industry, 2.1 times; and that of the power industry, 7.1 times; and so forth. In order to fulfill these tasks, an intensive work was carried out for exploiting the rich mineral resources with greater economic effectiveness, for their utilization as rationally as possible and for an uninterrupted improvement of labor productivity, through the improvement of the level of mechanization and of training.

The Seventh Party Congress assigned even greater tasks to the mineral industry so that it might further develop at a rapid pace. In the Sixth Five-Year Plan, the rapid development of industry, on a certain road, was directly linked with the development of the mineral extraction and processing industry.

Compared to 1975, in 1980, it is anticipated that the extraction of chrome ores will be increased by 47 percent; the extraction of copper, 55 percent; the extraction of coal, about 2 times; and the extraction of ferronickel ores, 3.5 times; and so forth.

The technique of the extraction of minerals from the depth of the underground has also been developed in a noticeable manner. Today, in our mines, there are such machinery and equipment that provide all the possibilities for an utilization as normal as possible and, on the basis of advanced technical conditions, they have a positive influence on the accentuated improvement of labor productivity. In our mines, we have successfully assimilated not only drilling with ordinary and telescopic hammers, but also the most advanced way of drilling currently known: drilling with wagon-drills.

Prefabricated scaffolds are successfully utilized in our country; and prospects have been open for scaffolding anchored with metal posts which has begun to be used in the coal mines. Now efforts are being carried out to satisfy a requirement of the time, that is, that in the mines, especially in the largest mines, the mechanization of the processes should be done in a more complete way, through the new machinery and equipment that will be produced by our machine plants, as a result of the studies and scientific experiments of our people.

The solution of the difficult problems of mineral science is linked with concrete studies and experiments, in harmony with the conditions of each sector or mine. In the future, these studies will be multiplied and will become more necessary, with the increase in depth of the workings in mines, bringing into the open such problems and phenomena which have not had so far but, as always, they will be handled with our own forces by our educated people, tempered with the party ideology and with Comrade Enver Hoxha's teachings.

The design work of mines is presented as a continuation and as a component part of the scientific studies. In the present conditions, because of the very requirements which life has set forth before the mineral extraction technology, the execution of complete projects is required for the opening and exploitation of mines. Without a studied and rational designing of each mine field, it is not possible to execute, on schedule and completely, the tasks assigned to the mineral industry today and, especially for the future. The creation of the bureau for the designing of mines and the work it has done during the past years have insured that no mine will be opened without a blueprint for its opening and utilization. The aim of the party has been and is to exploit the underground riches in the most complete way, increasing more and more their economic effectiveness in order to get from them the products which are needed most by the country and which raise the level of independence of the economy.

A qualitative step has been achieved in the field of petroleum processing. The petroleum processing plants were constructed one after the other; and the plant for the deep processing of petroleum was put into operation in Ballsh last year. In spite of the continuous acts of sabotage by Chinese revisionists, our workers, led by the communists, created all the conditions not only for processing all the petroleum, but also for providing the main by-products for the entire economy. In this way, we have all the opportunities to construct plants, in a short period of time, for the production of new by-products and to build the petroleum chemistry industry, so that our country

will end the import of by-products and of the various chemicals, extracted from petroleum, and improve the value of petroleum and of its by-products, as raw materials.

The processing of useful solid ores begins with the enrichment of the poor ores and extends to the casting of copper, ferronickel and chrome ores and so forth. In the situation that was created after the revisionist blockade, our country, after 1960, found itself in the preliminary steps and without any experience in the field of enrichment of poor ores. It was the period when the first plant for the copper enrichment had just been put into operation in Kurbnesh. Relying on the tasks assigned by the Fourth Party Congress, that is, for the creation of new branches of the industry for the processing of mineral raw materials in the country, a number of measures were taken for the building and expansion of this important sector of the mineral industry. The obstacles brought about by the fierce imperialist-revisionist blockade were also crushed in the sector of the enrichment of minerals, by constructing new enrichment plants and perfecting the technological process. Today, in our country, we have in operation three plants for the enrichment of copper ores, two plants for the enrichment of coal, two plants for the enrichment of chrome ores and one plant for the enrichment of ferronickel. In the future, the number of these plants will be further increased. Very important steps have been made in the field of the designing of enrichment plants with our own forces; and the most important thing is that 90 percent of the machinery of these plants is produced with our own forces, in our machine plants--a fact that constitutes a should base for the expansion of the sector for the enrichment of all kinds of minerals. Today, one-third of the production of blister copper is taken from copper concentrates that are produced in the enrichment plants. In the future, this ratio will be even greater, because of the very fact that the enrichment of ores, through the construction of enrichment plants near the mineral-rich areas, will reduce transportation expenses and because it is of economic advantage.

The tasks of the extraction industry, especially of the processing industry, for the future are great and difficult, but fully realizable. Guarantees of this are: the farsighted leadership of the party and its correct economic policy, the experience that has been amassed and the high awareness of our workers in all the sectors of the economy. A guarantee for achieving the set targets also is the large and intensive participation of our people in the process of the expansion of the technical and scientific revolution which is successfully developing in our country. In the extraction and processing industry, the technical and scientific revolution finds a wide and very appropriate terrain for expanding and extending; but, it also has a powerful support for intensifying and developing itself at more rapid rates.

Today, the copper ore extraction and processing industry has become one of the most developed branches of our metallurgical industry. The rates of development of the copper industry have been extraordinarily high, both in breadth and in depth. We began this road with the construction of the copper plant in Rubik, where blister copper was produced and was exported without being processed. It was with our own forces that the copper casting plant

was designed and constructed in Kukes; the opportunities to pass to the further processing of blister copper were also created by producing new articles. The 1960 yield of blister copper is produced today in less than 2 months. It was on the basis of increased production of blister copper that we passed to the construction and putting into operation of the copper refining plant in Rubik and of the plant for the production of copper wires in Shkoder.

Thus, we assured the complete cycle of the copper ore processing in our country, greatly improving the economic effectiveness of this branch. Likewise, the value of the export of copper ores was also increased, because of the fact that in 1979, 85 percent of copper ores is exported in the form of processed products and 15 percent as blister copper. With the putting into operation of the pyrometallurgy plant in Lac, where copper concentrates and copper mines that have high content of copper, will be melted, in order to extract the entire quantity of blister copper which will be processed in the country will be exported in the form of copper products. In the future, the copper industry will increase its processing level by producing other articles to satisfy the needs of the economy and for exports, such as copper pipes, posts, copper sheets, alloys and so forth.

The first steps for a new branch of the processing of heavy industry--ferrous metallurgy--were taken in 1966. In the beginning, we put into operation the sheet iron plant in Elbasan. As a result of the self-denying work of the working class, headed by the party, defeating the fierce imperialist and revisionist blockade and the sabotaging work of the Chinese revisionists, we constructed the "Steel of the Party" metallurgical combine, this magnificent work of our Marxist-Leninist party.

Another branch of our metallurgical industry was started in 1979--the ferrochromium branch--which, by processing the ferrochromium ores of the country, produces carbonic ferrochromium and so forth.

The magnificent successes achieved under the party leadership in the creation, strengthening and blossoming of the extraction and processing industry for petroleum, gas, chrome, coal, copper, ferronickel and so forth have strengthened the economy and the defense capacity; they are a powerful base for always leading further the rapid and independent development of our socialist economy.

The workers of the mining, petroleum, and geological sectors, as all the other workers, are mobilized with all their forces to implement the great tasks of the Seventh Party Congress in order to celebrate the great feast of the 35th anniversary of the liberation of the fatherland with great achievements. Led by the teaching of the party and of Comrade Enver Hoxha, as always, they will engage all their physical and mental forces in fulfilling the tasks entrusted to them for this five-year plan and for the future, in order to achieve new victories and to give the fatherland as much petroleum, minerals and products as possible, enriched and processed in the country with our own forces.

BULGARIA

GOVERNMENT REGULATIONS IN CONNECTION WITH IMPORTS

Sofia DURZHAVEN VESTNIK in Bulgarian 4 Mar 80 pp 210-215

[Council of Ministers General Conditions on Contracting for Import Goods]

[Text] Section I

General Stipulations

Article 1. (1) The present general conditions governing contracting of import goods, henceforth referred to as "general conditions," shall settle relations between economic organizations or their branches, subsequently identified as "applicant" on a commission basis and "purchaser" if importing at their own expense, and foreign trade organizations, subsequently identified as "importer." They shall be binding to the parties regardless of whether or not referred to in the contract.

(2) Imports based on the present general conditions shall be made by the foreign trade organizations on a commission basis on their behalf or on behalf of the economic organizations or their branches, on the basis of contracts concluded with economic organizations or their branches for import orders, stipulating import conditions and reciprocal relations.

(3) By reciprocal agreement with economic organizations or their branches or other legally stipulated cases, the foreign trade organizations may import goods on their own account through delivery contracts.

Article 2. In the case of commission imports the mandatory stipulations of international laws to which the Bulgarian People's Republic is a signatory are mandatory in the internal contract.

Article 3. The parties have the right to include in the contracts other stipulations as well not included in the general conditions and not conflicting with them.

Article 4. In commission imports the basic obligations of the parties shall be the following:

1. For the applicant:

- a) To order and stipulate to the importer commodities in terms of type, quality, deadlines, and other conditions on the basis of which they should be purchased from the foreign supplier;
- b) To provide the importer with the necessary funds in foreign currency to pay for the goods;
- c) To receive the goods in accordance with the stipulations of the contract concluded between it and the importer, the general conditions, and the stipulations of other legal regulations regarding imports, as well as the transferred rights concerning the goods;
- d) To compensate the importer for all expenditures in foreign exchange or their equivalent in leva, incurred by the importer in connection with the import--transportation, insurance, fees, etc.;
- e) To pay the commission to the importer for the work done based on the foreign trade contract;
- f) To compensate the importer, in the corresponding currency, for all penalties, compensations, and other expenditures to be paid to the foreign supplier by the fault of the importer;

2. The importer:

- a) Shall conclude with the foreign supplier a contract for the import of goods by type, quality, and deadlines and other stipulations based on the order, the present general conditions, and the stipulations of the other legal stipulations governing imports;
- b) Transfer to the applicant the rights stemming from the foreign trade contract and to secure the receipt of the commodity in accordance with the conditions of the contract, the present general conditions and other legal stipulations governing imports;
- c) Account to the applicant, in accordance with the established procedures, for all expenditures, paid compensations, fines, and so on;
- d) Exercise all rights against the foreign supplier on the basis of other contracts related to imports (transportation, insurance, etc.), and to deliver the goods to the economic organization no later than 15 days following their arrival;
- e) Compensate the economic organization for damages it has suffered by the fault of the importer.

- f) Fulfill its obligations on the conclusion and execution of the foreign trade contract for deliveries showing the necessary concern;
- g) Supply information if so requested by the applicant on foreign market conditions;
- h) Inform the applicant on the execution of the import contract.

Section II.

Conclusion of Contracts

Article 5. Contracts for imported goods shall be concluded in accordance with the procedure and deadlines stipulated in the corresponding laws.

Article 6. (1) In accordance with the state assignments and foreign exchange ceilings, the applicants (purchasers) shall submit to the importers from specific countries the specifications concerning required commodities and import deadlines.

(2) Along with the specifications the applicant (purchaser) shall submit to the importer all blueprints, sketches, plans, technical descriptions, standards, norms, and others, required for the identification of the type and quality of the goods along with the production visa (permit) issued by the competent state organ regarding such commodities, should such a permit be required.

(3) The importer and the applicant (purchaser) shall agree on the means and deadlines for submitting and coordinating the specifications of the goods not described in the legal document.

(4) The importer must take into consideration the stipulations and conditions governing imports as per the preceding paragraphs, in observing the legal stipulations governing imports of respective commodities, and to do everything possible to sign an according foreign trade contract. Should this be impossible, and should the applicant (purchaser) disagree with the conditions of the foreign supplier, no internal contract shall be signed and all adverse material consequences of the act shall be borne by the applicant (purchaser).

(5) Should the foreign supplier reject the conditions of the applicant (purchaser), the importer shall ask him to participate in the discussions leading to the conclusion of a foreign trade contract. The failure to respond or nonparticipation of the applicant (purchaser) in the talks shall indicate his disagreement with the conclusion of the foreign contract under conditions different from his own and the contract shall not be signed. All adverse property consequences shall be borne by the applicant. The fact shall not relieve the importer from his obligation to seek another foreign supplier.

(6) In the case of imports of machines and equipment, the importer shall supply the necessary spare parts as well, according to type, quantity, and deadline in accordance with reciprocally accepted specifications.

Article 7. (1) Import contracts shall not exceed the levels stipulated for ministries, departments, economic organizations, associations, and enterprises in physical terms or extent of allocated foreign exchange by type of country.

(2) Imports of complete projects shall be based on established procedures and conditions.

(3) In a commission contract or a contract for the delivery of machines, equipment, and complete projects for investment purposes, the sources of capital construction funds shall be mandatorily identified.

Article 8. (1) Legal representatives of the applicant (purchaser) may participate in the discussions leading to the conclusion of foreign trade contracts. The contract stipulations thus agreed upon shall be initialed by the representative of the applicant (purchaser) and shall be mandatory in relations between importer and applicant (purchaser).

(2) The participation of a legal representative of the investor-applicant (purchaser) shall be mandatory in the conclusion of a foreign trade contract for the import of one-of-a-kind machines or complete projects for a specific sector.

Article 9. Should amendments or supplements be included in the specifications or other conditions in the course of discussions with a foreign supplier for the conclusion of a contract or in the course of its implementation, unless other deadlines have been stipulated, the applicant (purchaser) must inform the importer within a 10 day period of his agreement to the suggested amendments and supplements. In cases of disagreement the contract between the importer and the applicant (purchaser) shall remain unamended.

Article 10. If so required, at the request of the applicant (purchaser), the importer must immediately submit a suggestion to the foreign supplier regarding changes in the type, variety, or other indicators of the stipulated commodity. The importer shall promptly inform the applicant (purchaser) of the results of the proposal submitted to the foreign supplier and of the conditions under which changes may be made.

Article 11. (1) Each of the parties to the contract, based on the interests of the national economy, and should the possibility for the production of the commodity contracted for become available to the country, or should more favorable import conditions be offered by another party, shall request the corresponding competent authorities to cancel the import and secure supplies either produced locally or imported from

another country, submitting a proposal as to the means to be used to settle the consequences of the violation of the concluded contracts.

(2) Should the competent authority accept the proposal, it must describe the method through which eventual consequences of the partial or entire annulment of the contract between the importer and the foreign supplier are to be settled.

(3) Should the competent organ have issued an order amending or canceling the concluded contract not at the request of any of the parties but on its own initiative, without having settled the consequences of such amendment or cancellation, the order shall be executed after the competent organ has settled the consequences.

Section III.

Delivery and Supply Deadlines

Article 12. Deadlines for commodity imports shall be stipulated in the contracts concluded between the importer and the applicant (purchaser) and in the appended specifications. The deadlines for the internal contract shall be consistent with delivery deadlines based on the foreign trade contract and the transportation time outside the country.

Article 13. The importer shall import the commodity ahead of time should this be stipulated by the law or should the applicant (purchaser) and the Bulgarian Foreign Trade Bank have given their agreement. In coordination with the interested ministry and the Bulgarian Foreign Trade Bank, the Ministry of Foreign Trade may allow such imports with a view to saving foreign exchange as the result of favorable market circumstances. In such cases they shall stipulate the conditions governing such imports.

Article 14. (1) The purchaser shall accept and pay for the delivered goods after the stipulated deadline should the importer be mandated to accept goods ahead of schedule in accordance with the international contracts, agreements, or other documents concluded by the competent organs.

(2) The importer must inform the purchaser at the proper time regarding such contracts, agreements, or documents.

(3) The stipulations of the preceding paragraphs shall not apply to contracts concluded for a specific deadline--fixed deals.

Article 15. By request of the applicant (purchaser) the importer must immediately take the necessary steps with the foreign supplier for the ahead of schedule or delayed delivery of contracted goods. Relations between importer and purchaser shall be based on the agreement reached with the foreign supplier.

Article 16.* In the case of advanced, ahead of schedule, or delayed import of goods under the stipulations of Articles 13, 14, and 15, the applicant (purchaser) shall receive from and pay to the importer the stipulated amount.

Section IV.

Quality of the Goods

Article 17. (1) The goods must meet the qualitative and other indicators stipulated in the contract or appended specifications, samples, technical descriptions, standards, norms, and other requirements as stipulated in the contract.

(2) Concluding a contract, the parties must specify the quality indicators of the goods.

(3) Whenever a competent state technical quality control organ has issued a visa (permit) for importing commodities, no changes in quality and indicators may be made without the approval of the same organ.

Article 18. (1) In order to ascertain the quality of the goods, the importer must submit to the applicant (purchaser) manufacturer's or other certificates, if so stipulated in the contract, or if so required by the law. Unless otherwise stipulated, such documents shall accompany the corresponding commodity.

(2) The submission of a commodity quality certificate shall not relieve the importer from liability should the quality fail to meet contractual stipulations.

Section V.

Commodity Packaging and Labeling

Article 19. (1) Commodities shall be imported with the packaging, labeling, and markings and wrapping suitable for export and their protection in the course of their haulage to their final destination and suitable for normal handling and storage under contractual or conventional circumstances.

(2) By request and at the expense of the applicant (purchaser) the commodity may be supplied in special containers and with special labeling and marking.

(3) The packaging, labeling, and marking of the commodities shall be based on the stipulations of state standards, norms, technical conditions, or commercial practices of the foreign supplier unless otherwise stipulated by the parties.

(4) By request of the applicant (purchaser) and in accordance with the foreign contract, the importer shall submit the necessary drawings, sketches, instructions, or other data in the Bulgarian language, required for the proper utilization, handling, and storage of the commodity for each individual commodity unit.

(5) Each parcel must carry the name of the importer, contract or order number, gross and net weight, and a packaging sheet, specification containing a detailed description of the content of the parcel, and instructions concerning each individual factory packaging, as well as other eventual data stipulated in the contract.

Article 20. (1) Should the delivery or supply of the goods be in the packaging supplied by the applicant (purchaser), the contract should stipulate the method, deadlines, and place of delivery of the packaging.

(2) Should containers, tanks, heating units, tarpaulins, or other items to be returned be used in the case of imported commodities, the contract shall include the means, deadlines, and place of return and call for penalties for delayed restoration or nonrestoration. In such cases the importer shall mandatorily submit to the corresponding transportation or shipping organization all necessary data and documents within deadlines insuring their prompt return.

Section VI.

Information, Shipping and Transportation

Article 21. (1) The type of transport and other conditions related to the haulage of the goods shall be stipulated in the contract signed by the importer and the applicant.

(2) The importer must notify (advise) the applicant (purchaser) within the time stipulated in the contract of the shipment of all goods as per the contract. Should the contract not stipulate the deadline and method of information (advice) on the shipment of the goods from the foreign country, or else no stipulation have been made requiring information concerning haulage by rail, truck, or water, the importer must inform the applicant (purchaser) as to the deadline and method, so that the information may be received before the commodity has reached the border of the Bulgarian People's Republic, thus enabling the purchaser to secure domestic transport and organize the immediate loading of the goods; in the case of bulky or extra heavy freight whose haulage requires special facilities, the importer must supply the information to the applicant (purchaser) no later than 15 days prior to the arrival of the commodities in the country.

(3) Unless otherwise stipulated in the contract, the announcement (advisement) should contain data on the day of shipment, the description

and quantity of the commodity, the contract or order number, the type of transport facility and the destination, as well as data enabling the applicant (purchaser) to secure the amount and kind of transport facilities should this be necessary.

(4) Should the shipping be made by the importer, the information must be given to the final receiver.

Article 22. In the import of goods by water, should the permit and instructions concerning the shipment to the domestic receiver be in charge of the importer, the importer shall provide the internal transportation facility. In this case, with the conclusion of the contract, the applicant (purchaser) must issue the importer a written permission for shipping the goods to the domestic receivers.

Article 23. (1) Should imported goods not be distributed through the importer but centrally by the applicant (purchaser) or its superior organization, internal transportation shall be the concern of the applicant (purchaser) or its superior organization.

(2) In the cases stipulated in paragraph (1) of the present Article, before the 12th of the preplanned month, the importer must inform the applicant (purchaser) in writing, indicating data on the quantity of the goods and the port of delivery.

Article 24. (1) In the conclusion of the contract for import of goods by rail or truck the applicant (purchaser) must provide the importer, in writing, instructions governing the distribution of the shipment of the goods to the domestic receivers.

(2) The contract may stipulate other distribution deadlines for the commodities. Should groups of freight cars or trucks be required, the distribution instructions shall apply to the individual parcels.

(3) On the basis of the distribution instructions the importer shall instruct his shipping agent to ship the commodity to the final domestic receiver.

(4) The applicant (purchaser) may change the distribution of the goods arriving by water by no later than the 10th of the month preceding the month of the execution of the contract; for goods transported by rail or truck, the changes may be made prior to the arrival of the commodity at the import border point, in which case all expenditures, fines, or compensations related to the change must be paid by the purchaser.

(5) Distribution amendments may be made by the applicant (purchaser) only to the importer or, if so stipulated between them, the shipping organization, which shall be informed of the stipulation by the importer.

Article 25. Empty railrage shall not be charged by the Bulgarian State Railroads for the distance traveled by the freight cars within the country should they fail to be loaded to capacity abroad, unless the shipping or transit country does not call for the payment of freightage for underloading in accordance with its rail fee rates.

Article 26. (1) Unplanned expenditures related to the haulage and processing of commodities in ports (demurrage, dispatch, time losses, storage fees, freightage, etc.) incurred in the country or abroad shall be paid by the applicant in the corresponding foreign currency.

(2) Demurrage stemming from the mooring of ships in Bulgarian port piers caused by the lack of manpower, mechanization facilities, electric current, warehousing facilities, or stiff, handling inconsistent with port norms caused by the lack of freight cars and trucks, etc., shall be charged to the ports.

Section VII.

Execution of Contracts

Article 27. (1) In the case of commission imports, the right to ownership and the risk are transferred to the applicant as of the time at which they are transferred to the importer from the foreign supplier as per the concluded contract.

(2) Unless otherwise stipulated, in a supply contract the right of ownership and risk are transferred from the importer to the purchaser as follows:

1. For goods supplied by rail--at the time of delivery of the freight car at the border railroad station from the foreign railroad administration to the Bulgarian railroad administration; in the case of small shipments and parcels mixed with other items in the freight car, at the moment of delivery to the warehouse under customs control;

2. In the case of goods supplied by water--at the time of their delivery to the port authorities and the unloading port;

3. For trucked goods: at the time the commodity crosses the Bulgarian border customs point;

4. For goods supplied by air: at the time of delivery of the commodity to the warehouse under customs control at the receiving airport;

5. For mailed goods: at the time of delivery of the postal parcel to the respective receiving customs post office.

(3) Should the parties stipulate that commodities are to be delivered and accepted, the place of delivery shall be stipulated by reciprocal agreement. In this case the right of ownership and the risk are transferred from the importer to the purchaser at the time of delivery.

Article 28. Unless otherwise stipulated in the contract, the number of parcels and the weight of the imported goods shall be determined by:

1. By rail: The number of parcels and the weight as indicated in the international bill of lading, providing that they have been checked at the shipping railroad station. Should they be declared by the foreign supplier and not checked by the shipping railroad station, they shall be based on the number of parcels and the weight determined at the receiving railroad station as per Article 112 of the Railroads Bylaws. In such cases, by request of the applicant (purchaser) the railroad must investigate the number of parcels and the weight of the goods as indicated in the bill of lading and a proper protocol be mandatorily drawn up indicating the results;

2. In the case of waterway imports: based on the number of parcels and the weight as indicated in the bill of lading or the Danube River bill of lading;

3. Imported trucked goods: by the number of parcels and the weight indicated in the truck bill of lading;

4. Air freight: by the number of parcels and the weight indicated in the air bill of lading;

5. Mailed goods: by weight indicated in the postal receipt.

Article 29. (1) In cases of shortages or damages noted in releasing the commodity from the transport facility, the transporter shall mandatorily draw up a protocol in accordance with the procedure stipulated in the laws governing the respective transport facility.

(2) Shortages and damages of goods transported by water shall be recorded in accordance with the procedure stipulated in the regulations governing transportation by waterway.

(3) In the case of goods supplied in their original factory undisturbed packaging, quantity and quality control shall be made at the receiver's warehouse where a protocol shall be drawn up by the competent control authority.

(4) Whenever shortages, damages, or defects have been caused by circumstances for which the foreign supplier is liable the documents, protocols, and other proofs must be drawn up in accordance with the procedure and deadlines and individuals, and observance of other conditions

stipulated in the contract with the foreign supplier to the extent to which they are in accordance with the stipulations of Article 6 of the present general conditions.

Article 30. Food products, citrus and other fruits, eggs, seeds, and other goods whose nature, stipulations of intergovernmental treaties, agreements, or foreign contracts may be graded at the receiving port or any other place within the country by the corresponding competent control organ, shall be delivered and billed by the importer to the purchaser on the basis of said grading. The entries in the grading documents shall be mandatory should it become necessary to file claims.

Article 31. (1) Checking the commodity, the applicant (purchaser) must draw up documents and proofs consistent with the means and the deadline protecting the rights of the importer when dealing with the foreign supplier, insurer, or carrier, and demand the drafting of the necessary statements and legal documents. In the opposite case all adverse consequences shall be the liability of the applicant (purchaser).

(2) The conditions of the preceding paragraph must be stipulated by the parties in the conclusion of a contract.

Section VIII.

Prices and Payments

Article 32. Imported goods shall be paid for in accordance with the stipulated procedure and prices.

Article 33. (1) Payment for the goods shall be based on the Directive on Payments against the presentation of a bill which shall include the number and date of the accountability document on the shipping of the goods issued by the shipping organization and the cost of the delivery of the commodity; in waterway imports it shall include the number and date of the order of the shipper to the port on the delivery or shipment of the commodity; in goods submitted on the basis of a delivery-acceptance protocol, the number and date shall be entered.

(2) By request of the importer the credit payment method to settle accounts between the applicant or purchaser and the importer may be acceptable as well.

Section IX.

Guarantees

Article 34. (1) The importer shall give the purchaser the same guarantees given by the foreign supplier.

(2) The importer must see to it that the guarantee provided by the foreign supplier be as adequate as the guarantee which the supplier usually provides to his customers. This applies both to goods imported on a commission basis as well as contracts for commodity imports.

(3) In all cases of defining the guarantee terms the contract between importer and purchaser must provide for the possibility of the importer to exercise his rights in terms of the foreign supplier.

Article 35. The importer shall not be responsible for damages caused as a result of improper maintenance, handling, or use of the commodity and violations of operational instructions, or changes made by the purchaser or improper installation.

Section X.

Contract Violation Consequences

Article 36. The applicant (purchaser) must check the quantity and quality of the imported commodity and the observance of the other contractual stipulations. All violations must be promptly noted and a claim filed against the importer. The final user may submit the claim to the importer with a copy to the applicant (purchaser). This will also be considered a claim filed by the applicant (purchaser) unless otherwise stipulated in the contract.

Article 37. (1) The claims must be filed within the time stipulated between the importer and the applicant (purchaser) in accordance with the nature of the commodity and the stipulations of the foreign trade contract.

(2) In the case of goods imported from countries with which the Bulgarian People's Republic has concluded international treaties, agreements, or other acts settling conditions and terms governing claims, contracts concluded between the importer and the applicant (purchaser) must be consistent with the former. The necessary period of time must be stipulated enabling the importer to file the claim against the foreign supplier.

(3) In the case of goods carrying a guarantee, claims must be filed immediately following the discovery of the defect but no later than 10 days following the lapse of the guarantee, providing that the defect was discovered within the period covered by the guarantee.

(4) In the case of an overdue claim filed by the applicant (purchaser), the importer must make the necessary presentations to the foreign supplier to accept the claim and, should the outcome be positive, submit the results to the applicant (purchaser) within 15 days. The additional cost of an overdue claim shall be borne by the applicant (purchaser).

(5) The nonfiling or delayed filing of claims or failure to take the necessary steps protecting the rights of the importer with the foreign supplier shall deprive the applicant (purchaser) of the right to appeal to arbitration, court, or other competent authorities for redress.

Article 38. The written claim must indicate the quantity, type, and name of the commodity: the nature of the claim (shortage, quality inconsistency, incomplete delivery, etc.), the contractor order, data identifying the commodity (number of the freight car, bill of lading, bill, etc.), as well as the specific settlement claim, and others. The document of the corresponding competent control organ must be mandatorily appended to the written claim unless the foreign trade contract stipulates a different procedure for filing a claim with which the applicant (purchaser) is familiar.

Article 39. All claims must be submitted in writing. The date of the claim is that of the stamp seal of the mailing post office or the date of receipt should it be submitted to the importer's bookkeeping service.

Article 40. (1) Claims filed against one shipment do not entitle the applicant (purchaser) to refuse to accept subsequent shipments based on the contract, unless otherwise stipulated in the foreign trade contract and unless the conditions of the foreign trade contract are mandatory to the domestic co-contractor.

(2) The applicant (purchaser) must store the refused commodity under proper conditions should he refuse to accept it.

Article 41. (1) Following receipt of the claim the importer must consider it and provide an answer within 30 days.

(2) Based on the type of commodity and import stipulations, the parties may agree on other deadlines for answering a claim, should the import be paid by the importer.

Article 42. (1) In commission imports the liable party bears full property responsibility in leva and foreign exchange based on the reason for the damage.

(2) Should violations be caused by the foreign supplier, on the written agreement of the applicant, the importer must exercise all the rights stipulated in the foreign trade contract and inform the applicant of the results within 15 days.

(3) Should the exercise of rights based on a foreign trade contract be determined by arbitration or through the courts, the applicant must pay in advance to the importer the necessary expenditures in foreign exchange and leva and provide full assistance to the importer and submit to him

all the necessary evidence for the successful defense of the case. Under exceptional circumstances, and by permission of the Ministry of Foreign Trade, the importer may exercise his rights against the foreign supplier even without the agreement of the applicant, advancing expenditures in foreign exchange and leva which must be repaid by the applicant within 15 days.

Article 43. (1) Should the importer import at his own expense (delivery contract), the parties to the internal contract guilty of nonfulfillment shall be held liable in accordance with the legal stipulations governing socialist organizations.

(2) The purchaser must fully cooperate with the importer and supply him with the necessary proof of the liability of the foreign supplier. The purchaser must compensate for the factual damage should he fail to meet this obligation.

Provisional and Final Stipulations

1. The present general conditions were adopted with Decree No 3 of the Council of Ministers, dated 4 February 1980, on the basis of Article 3 of the Law Governing Contracts Among Socialist Organizations, invalidating the General Conditions Governing the Supply of Import Commodities (DV, No 60, 1970).

2. Council of Ministers acts containing specific stipulations governing certain imported commodities remain unaffected.

5003

CSO: 2200

1979 PERFORMANCE OF METALLURGICAL AND MACHINE BUILDING INDUSTRIES

Prague HOSPODARSKE NOVINY in Czech 15 Feb 80 p 2

[Commentary by Jiri Poslt, departmental deputy director, CPCZ Central Committee]

[Text] In the course of fulfilling its economic plans the metallurgical, machine-building and electrical engineering complex had to contend with some formidable internal and external problems. The industries under the jurisdiction of the Ministry of Metallurgy and Heavy Engineering did a creditable job of fulfilling their assigned production tasks; not only did they wipe out the January deficit in the production of finished goods, but they also fulfilled the annual plan at a rate of 100.4 percent and overfulfilled it by Kcs 542 million. At the same time all of the economic production units in this ministry's jurisdiction fulfilled their respective production plans. The efforts of the workers employed in these industries aimed at making up for production shortfalls is also attested to by the number of enterprises which failed to fulfill their commodity production plans. Compared to 78 enterprises in January, the number of enterprises in this category at the end of the year dropped to only four, i.e., NHKG [Klement Gottwald New Metallurgical Works] Ostrava, SEZ [Slovak Electrical Engineering Plants] Krompachy, ETZ [Electrical Engineering Plants] Teplice, and Sigma enterprise in Zabadka.

The ministry managed to boost its product-mix plan fulfillment rate from not quite 87 percent in January to 97.84 percent at year's end. During the course of the year the biggest problems related to the fulfillment of brand-name product output plans were experienced by the VHJs Skoda of Plzen, CHEPOS of Brno, the Non-ferrous and Ferrous Mines of Bratislava, and the Vitkovice. On the other hand, these problems were offset most of all by the positive performance record with regard to the ministry's product mix plan turned in by the VHJs Metalworks, Sigma-Olomouc, and the Czechoslovak Pneumatic Engineering Plants.

The ministry surpassed its labor productivity target by 100.3 percent. The ministry is deserving of praise for the fact that, in the wake of the variable performance records turned in by some VHJs in their efforts to

fulfill this indicator during the course of the year, by the end of the year all of the ministry's VHJs fulfilled and surpassed this target. This also had an impact on the labor productivity growth index which went up by 102.8 percent in comparison with the planned increase of 102.4 percent. Thus, the growth in real output was offset by an increase in labor productivity at a rate of 75.7 percent, in contrast to the planned ratio of 72.7 percent.

A satisfactory performance record was turned in with regard to all product marketing tasks. The sales volume target was surpassed overall by Kcs 3.4 billion (102 percent). In terms of sales of finished goods this success was aided above all by large deliveries of capital goods (107 percent), the sales volume targets for which were surpassed by nearly Kcs 1 billion. For the domestic market as well the plan was fulfilled in terms of retail prices by 101.2 percent (surpassing the plan target by Kcs 31 million).

In the fulfillment of export tasks the ministry succeeded in meeting plan targets in the case of the metallurgical VHJs which fulfilled and even increased sales volume targets with regard to exports both to the socialist and non-socialist countries. But as a result of engineering and capacity problems the machine building industry failed to meet all of its export sales targets. The result was that the ministry underfulfilled the plan target for exports to the socialist countries by Kcs 89 million (99.6 percent) in wholesale prices and by Kcs 156 million (99.4 percent) in FOB prices. Most of the failures accounting for this shortfall are concentrated in the VHJs Vitkovice (- Kcs 747 million), CKD-Prague (- Kcs 45.9 million), and CHEPOS of Brno (- Kcs 31.5 million). A more favorable situation exists with regard to exports to the non-socialist countries, and this is so in spite of a number of objective difficulties and, notwithstanding a number of objective difficulties which had to be surmounted during the course of the year, the plan was overfulfilled in terms of FOB prices by 102.6 percent. The value of deliveries made in excess of plan targets amounted to Kcs 292 million.

Taking into account this performance record, it can be said that the ministry has succeeded in fulfilling its export sales plan targets for the fourth year of the Sixth Five-Year Plan. Over the past 4 years the ministry has fulfilled the original Five-Year Plan quotas for exports to the socialist countries by 123.3 percent (a growth index of 137.1) and it has surpassed the original quotas for exports to the non-socialist countries by 120.7 percent (a growth index of 145.4).

The ministry fulfilled its annual planned volume of capital construction labor and deliveries by 100.7 percent, of which construction projects accounted for 95.3 percent. The fulfillment of this target contributed in a positive way to the overfulfillment of the target for the planned volume of capital construction labor in the category of projects involving budget expenditures of less than Kcs 2 million. Capital construction tasks in this category were not fulfilled by Ferrous Metallurgy, Metalworks-Prague, CKD-Prague, and Czechoslovak Pneumatic Engineering Plants.

On the other hand, the ministry failed to meet targets with regard to the planned volume of capital construction labor and deliveries in the category of building projects involving budget outlays of more than Kcs 2 million. The ministry fulfilled 93.8 percent of these targets overall and only 92.7 percent of its building project targets. The targets that were fulfilled in this category are attributable to the efforts of Ferrous Metallurgy.

During the course of the year the ministry gradually made up for its failure to fulfill the qualitative indicators of the profit and cost plan, a failure which is mostly attributable to the January downturn, and, as was predicted, succeeded in fulfilling its annual tasks in this area as well.

In regard to the ministry of general engineering it can be said that the commodity production plan for 1979 was overfulfilled by Kcs 110 million and that, as a result, a mean annual growth rate of 7.1 percent was achieved. Three of the ministry's VHJs were not able to wipe out the deficits which they incurred while fulfilling the production plan during the course of year as a whole, i.e., STROJSMALT of Bratislava (- Kcs 74 million), Tesla-Prague (- Kcs 61 million), and Chirana-Stara Tura (- Kcs 10 million).

From the standpoint of individual product marketing categories the capital goods deliveries plan was overfulfilled for the ministry as a whole by more than Kcs 2 billion, of which the Czechoslovak Automobile Plants in Prague accounted for Kcs 0.3 billion, the Mechanical Engineering Factories of Prague--Kcs 0.4 billion, the Automation and Computer Technology Plants of Prague--Kcs 0.4 billion, and the Heavy Engineering Plants of Martin--Kcs 0.3 billion. In terms of deliveries of consumer goods for the domestic market the national plan was underfulfilled by about Kcs 1 billion as measured in retail prices, and this was due in particular to the unfulfilled deliveries of Tesla-Prague and of STROJSMALT-Bratislava. A good performance record was turned in with regard to exports to the socialist countries. The ministry's export sales plan was overfulfilled by nearly Kcs 0.3 billion as measured in wholesale prices (coupled with a mean annual growth rate of 5.7 percent), in spite of the fact that the export sales plan was not fulfilled by the VHJ Zbrojovka-Brno, Tesla-Prague, Elitex-Liberec, and STROJSMALT-Bratislava. As measured in FOB prices the plan for export sales to the socialist countries was overfulfilled by Kcs 40 million coupled with a mean annual growth rate of 8.9 percent.

During 1979 the ministry failed once again to fulfill all of its planned tasks with regard to export sales to the non-socialist countries. These unfulfilled export sales cost Kcs 362 million as measured in wholesale prices coupled with an annual growth rate of 12.3 percent and Kcs 315 million as measured in FOB prices at an annual growth rate of 16.6 percent. In terms of wholesale prices this shortfall is mainly the fault of the VHJ Tesla-Prague and Elitex-Liberec, while in terms of FOB prices it is mainly the fault of Elitex-Liberec, the Mechanical Engineering Factories-Prague, Zbrojovka-Brno, and Tesla-Prague.

The failure to fulfill the national plan target for profits by Kcs 48 million did not exceed the margin of tolerance allowed by the Federal Ministry of Finance amounting to Kcs 125 million. The ministry's overall profit statement for the year was adversely affected by the VHA Czechoslovak Automobile Works-Prague and Tesla-Prague.

The ministry's plan fulfillment record for 1979 gives us every reason to expect that it will get off to a good start as we enter the last year of the Sixth Five-Year Plan. The efforts that need to be made in this regard were spelled out at the 14th session of the CPCZ Central Committee. What we need to do now is to see to it that these guidelines are acted upon in day-to-day organizational work. At the same time the purpose of our struggle to fulfill the economic plan must be based on our willingness to harness the vast resources and untapped potential of the national economy that consist in its material base and in the people which make it work. And in order to accomplish this it is above all necessary that we should make further dramatic improvements in the quality of management work, strengthen discipline, and make a systematic effort to eliminate shortcomings and their causes.

In line with the policy goals set forth by the party, these challenging tasks are compelling us to make far-reaching improvements in the efficiency of our economy. Concretely, this means that the metallurgical, machine-building and electrical engineering complex must make more effective use of its untapped resources, bring about further reductions in its materials and other costs, and do a better job of managing every koruna it invests in the capital replacement process. We need to be more insistent in the way in which we utilize the functions of economic planning levers so that they will be more responsive to changing economic conditions and to the process of upgrading quality control and so that they will lend effective impetus to the formulation of substantive economic policy tasks and performance indicators.

11813

CSO: 2400

COMPUTER MARS SYSTEM PRAISED

Prague TECHNICKY TYDENNIK in Czech 11 Mar 80 p 1

[Text] Hiring complications and its production tasks led Ferox of Decin to change over to higher data processing technology. Due to a shortage of its own computer personnel, the management of Ferox requested the CSVTS [Czechoslovak Scientific and Technological Society] House of Technology in Usti nad Labem to mediate assistance from other enterprises. In this way the ASRP [Automatic System for the Management of Industry] task--the trial and routine operation of material and technical supply (MTZ) and of production planning (TPV)--was solved on the EC 1021 computer at the Topos plant in Sluknov. Analysis revealed that the standard Mars programs for MTZ and TPV could be applied to the conditions at Ferox, with minimum personnel and an EC 1021 computer, in sufficient detail to make both areas more effective and to provide quick, accurate and reliable information for the management of MTZ and TPV.

It can be established that the MTZ subsystem has been fully mastered: after preparing a price list (the basic set of data concerning materials) and introducing organizational measures, the subsystem was realized within one year, according to the standard Mars program and the adopted modifications. The subsystem includes not only the actual inventory-control module (i.e., accession, issuance, stock position, out-of-stock items, etc.) but is also linked to accounting and other computations that eliminated and replaced tedious and demanding manual processing. The subsystem provides the programmed output reports for material and technical supply, including feedback to the other user departments.

In production planning--one of the most extensive and most important subsystems in building an automatic system for the management of industry--the situation is the same with respect to processing parts lists on an EC 1021 computer. Other data of the production documentation, and technological data solve the transition to the subsystem for the operational management of principal production (ORHV), with capacity plans by work stations, shops and plants.

In 1972, Ferox of Decin introduced net wages on punched cards (Aritma equipment). The experience and knowledge gained led to a plan for using a standard wage program according to the Mars system, and this project was realized

on the EC 1021 computer. A data base for wages and personnel matters was built, i.e., the Information File on Personnel was formed, which is the basis for the automatic processing of net wages on a computer. An algorithm was written for the actual processing of wages, with all the requirements and statutory provisions, and organizational changes were made in the flow of paperwork, including its adaptation to computer processing. The subsystem Workers was prepared in May and July 1978 for trial operation, and routine processing has been introduced since 1 January 1979.

1014

CSO: 2400

INTRODUCTION OF ELECTRONICS BRINGS LARGE SAVINGS

Prague SVET HOSPODARSTVI in Czech 28 Feb 80 p 2

[Text] Electronics, particularly microelectronics, is one of the key areas that determine the technological development of the national economy. Separate target programs for the development of this branch in our entire economy will be prepared within the framework of the Seventh Five-Year Plan.

Through 1990, complete application of electronics in Czechoslovakia could save over 300,000 workers and 10 to 20 percent of electric power consumption. With the help of electronics it is possible to build complex systems with several integrated circuits, practically negligible in size. This lengthens the service life of electronic systems and multiplies severalfold their reliability, at minimum servicing and maintenance.

The importance of electronics is the most pronounced in engineering, for example, in controlling the operation of machine tools and of programmable contactless control systems, in automating the handling of chips, and in directing by computer the entire production process. This development saves manpower, requires very little floor space, reduces the cost of the control system and thereby of the entire machine as well, optimizes the use of electric power and thereby contributes toward an absolute decline in power consumption.

Also in the textile industry the further development of nonconventional spinning machines, looms, knitting machines, industrial sewing machines and textile-finishing machines involves the use of electronic components and circuits. Conversion to electronics could save 50 to 70 percent of the manpower, 50 percent of the floor space, and it could reduce the size of the machinery by 20 to 30 percent.

Today the proportion of electronics in textile machinery is 5 to 10 percent in Czechoslovakia, whereas in the case of the top foreign products this proportion is at least double. Therefore it is essential to introduce electronics so as to make our machines more readily exportable.

Also in the automotive industry the introduction of electronics would first of all reduce fuel consumption by 15 to 20 percent. Electronically controlled automatic transmission systems increase engine life by about one-third, provide better control of the motor vehicle and make its operation safer.

HIGHER AGRICULTURAL PRODUCTION THROUGH BRIGADE KHOZRASCHET

Bratislava PRAVDA in Slovak 21 Mar 80 p 1

[Editorial: "Brigade Khozraschet"]

[Text] In the age-old cycle repeated with every year, spring is ever more strongly reasserting its sway over our fields, and awakening nature to life. For farmers today, just as for those of centuries past, the critical season of the year is beginning. In spring the growth of winter crops must be "gotten into shape" by agrotechnical measures and an enormous amount of work must be done on the crucial acreage in such a way that its result, in the form of the production of all crops, will correspond to the requirements of the plan. In this respect, this year, or more accurately, the coming six months, is even more demanding than previous years. One could say, extraordinarily demanding. Not with respect to those aspects that have recurred for centuries, but in respect to the quality of the work of every agricultural worker. From each agrotechnical measure taken or crop raising association society expects the attainment of the highest yields in our entire agricultural history. And since opinions as to the possibility of fulfilling this demanding task vary, now at the very beginning of the growing season we must remind ourselves that the tasks are demanding, but unrepudiable; discussions should be conducted in the spirit of the established principle that he who wants to solve a problem looks for ways to do this; he who does not want to looks for reasons why it cannot be done. And for the most part, remains content with objective reasons

The past year was a very unfavorable one for agricultural production weatherwise. But were objective factors really the only ones responsible for the non-fulfillment of the plans for crop production last year? The actuality is quite otherwise, evidence of which are the sometimes incredibly great differences in the harvests of neighboring areas, that is, in agricultural enterprises farming under comparable conditions. If we summarize only the examples that we have written about in Pravda recently upon the occasion of the acceptance of their cooperative socialist obligations by some cooperation districts, it becomes unambiguously clear that the most serious brake on our more successful progress in expanding not only crop production, but livestock production as well, is not primarily

objective but subjective factors. This truth was emphasized by the 13th session of the CPCZ Central Committee, which ranked shortcomings in management specifically at the top.

We do not want to take up the entire complex of deficiencies in the management of agriculture. We shall confine ourselves to just one problem, the insufficient, in fact almost totally nonexistent utilization of brigade khozraschot as an economic-organizational form of organizing work and remuneration that provides in socialist agricultural enterprises irreplaceable conditions for the most direct participation of the workers in the management of production and for creating a material self-interest for the members of the brigade in the final results of their work. This is, at the same time, a method that relieves agronomists and those responsible for mechanization from the necessity of operational work and unnecessary and demanding daily record keeping of work performed. This enables them to devote themselves primarily to their own specific work for which they have been chosen: the agronomic management of crop production so as to attain the most abundant harvest. This is all familiar, of course, but somehow not fully appreciated, even though the necessity of utilizing khozraschot is unambiguously mentioned in the resolutions of the CPCZ 15th Congress, and the need to put it into practice at an accelerated rate was also emphasized by the 13th session of the CPCZ Central Committee, and in the recent Series of Measures on Improving the System of Planned Management of the National Economy after 1980, khozraschot is made an organic element of planning.

In the last few days we have had a number of talks at JRD's [Unified Farming Cooperatives] that have gone over to branch management in large consolidated units. Everywhere they asserted that they are farming according to the khozraschot method. Not "managing," "farming."

The main idea of this khozraschot, they explained to us at many enterprises, is that crop raising branches record their transfers to livestock production in terms of volume and in some places, in terms of quality as well, and the mechanized centers, for a recorded payment, provide services to both branches. In the khozraschot method of management, however, this can only be considered a plan for an elegant house with no foundation, one built on sand. In discussions with the members of a number of cooperative districts (and more than once when secretaries of a number of CPS regional committees and CPS district committees for party work in agriculture and the food-processing industry and administrators from the OPS [zonal political directorate] were present) we have observed that comrades in agricultural enterprises have allowed brigade khozraschot to fall into oblivion because introducing an averaged ceiling in calculating wages would make it impossible to utilize the merit principle. But this principle is the life-blood of brigade khozraschot that makes it possible to reward people not according to the quantity of work performed, but above all according to the results of their work.

Now the situation has changed. Much has been forgotten, the task of bringing brigade khozraschot to full life was not mentioned in the latest resolutions of the CPCZ Central Committee and the government of the CSSR. Still, it would not be a bad idea for someone at the JRD's, or even at the regional and district committees to take a look at the archives.

Even if in recent years the creative initiative of the people has not been underrated by derogatory technocratic opinion, surely some pamphlets can be found about the work of comprehensively mechanized khozraschot brigades of Soviet innovators which are as relevant today as when they were written. Above all there is the pamphlet about Comrade V. Gitalov, two-time Hero of Socialist Labor and a deputy of the Supreme Soviet of the USSR, who has rightly been called the People's Academician-Mechanizer, and brigade-leader J. Pervitskii, Hero of Socialist Labor. Both comrades, delegates to the 24th and 25th CPSU Congresses, are still working at their posts today, more than 20 years later. We bring up their names in order to acquaint our readers with the work methods of their khozraschot brigades and so we can avoid unnecessary experimentation and errors. Nor should we forget the experience of the Transcarpathian corn-growing hundred-percenters and their dean, two-time Hero of Socialist Labor Comrade J. Pitro. Perhaps just a comment here: if some of our corn-growers, either farming or at the research institutes, pass over their experience in silence, we will be happy if their own methods prove better. This, however, has not happened as yet

What constitutes the essence of the brigade khozraschot used by comrades Gitalov, Pervitskii and Pitro? Although Comrade Gitalov leads a large, complexly-mechanized khozraschot brigade that raises all types of crops, and Comrade Pervitskii a small one tending 800 to 900 hectares, while Comrade Pitro leads a three-member brigade growing corn on 100 hectares, they all have one thing in common: the brigade as a whole has a material interest in the final results of their labor. And for 20 years in a row their yield per hectare has not fallen below 10 tons per hectare. In the agreement the brigade leader signs with the enterprise management is stipulated the total pay for all work done in achieving the planned harvest in terms of the size of the different crops and performance norms. One component of this agreement is the plan of other production costs: for seed, fuel, scheduled repairs, chemical and natural fertilizers, crop protection agents. In the course of the year the members of the brigade receive 80 percent of the guaranteed wage packet based on their participation in the work that the brigade leader organizes and keeps records on. The remaining 20 percent remains in the insurance fund of the brigade, which guarantees that the planned output will be achieved at this level of quality. That is to say, the brigade is able, through quality work, at least to this extent, to nullify the hostility of nature. Adherence to planned costs is also guaranteed by this fund. Advances from it are paid out to the members according to the percentage of the plan fulfilled, thus according to the final results of their work. If the planned harvest is exceeded, the brigade receives increasing premiums in cash and in kind.

This, in short, is the technical side of brigade khozraschot. It is a very important aspect, but not the most important. The chief and politically immensely important thing about brigade khozraschot is the fact that the form of the management of labor is changing. The direct management of and all aspects of control over the quantity and quality of work is being taken over by the brigade as a khozraschot collective that makes decisions about the overall conduct of business in the public sector entrusted to it. In this form of organization the principles of socialist democracy are manifested to their full extent, while any kind of indulgence with respect to technological discipline and the socialist principles of management is excluded. Here is manifested in crystal form the principle: as we work today, so we shall live tomorrow, as well as the socialist principle of wages: [from] each, according to his abilities; to each according to his work, where it is in the interest of the membership of the brigade that there not be any laggards among them, they they help the weaker, that they guide people to honorable, creative work.

Now it is time for us, too, to start down this road. We must, as they say, extend khozraschot from the enterprise level to its crucial endpoint, brigade khozraschot. During these next few days the resolution of the Presidium of the CPCZ Central Committee and the government of the CSSR on the series of measures on improving the system of planned management of the national economy, and resolution no 42 of the CSSR government of 31 January 1980 will be discussed in agricultural enterprises, among others. If they will reflect on this seriously and take worthwhile political-organizational measures, they will not merely state the correctness of the decision to introduce khozraschot everywhere, but will take advantage of the opportunity provided by the beginning of spring work to form khozraschot brigades, particularly in crop raising.

This is the unrepudiable order of the day for agricultural workers in fulfilling the resolutions of the party.

8805

CSO: 2400

FRG-GDR AGREEMENT ON RAILWAY EXPANSION POSSIBLE

Frankfurt/Main FRANKFURTER RUNDSCHAU in German 23 Feb 80 p 2

['In the Background' report by Karl-Heinz Baum: "The Reichsbahn Network"]

[Text] There were differences in opinion in Bonn over a possible participation by the FRG in financing the expansion of the GDR railway transit routes. The railway network of the GDR is now being viewed. What does it look like?

According to the newest edition of the Statistical Yearbook, 14,000 rail kilometers exist presently. Of these, 7,500 belong to the main routes on which the second German state transports four-fifths of its passengers and cargo and 6,300 kilometers involve marginal routes. According to the yearbook, of the main rail lines, 1,440 kilometers are electrified, that is about every 5th kilometer. But in proportion to the entire network that is only about 10 percent.

At the end of January, SED General Secretary Erich Honecker spoke before the district secretaries of the party, saying that transportation should "increasingly be transferred from the roads to the tracks" in order to conserve energy. In concrete terms he stated: "The railroad network has to have more electrified lines."

At the present time, the routes between Dresden and Berlin and between Bitterfeld and Berlin are getting electrical power. The assembly work, starting in the south and working its way up to Berlin, just recently approached the exterior ring of Berlin on the Bitterfeld line (which connects Berlin with Leipzig). In 1979, electrical power was provided for rail operations between Bitterfeld and Jueterborg. So another 70 kilometers have to be added on to the data provided by the yearbook. Both routes, from Bitterfeld and from Dresden to Berlin, should be completely electrified by 1982. But transit rail service between the FRG and West Berlin does not run on these two routes presently being converted.

The GDR still has to solve a profound problem for converting these routes in its network: A few sections of the routes are single tracked; for example,

this is the case for 70 kilometers on the main route from Berlin to Rostock. Since 1971 work has been progressing on making these two track routes: More than 1,100 route kilometers have since received a second track (GDR joke when traveling upon the single track route at a snail's pace: "Look out the window. The train is going so fast again that you can't even see the second track").

There are five railway transit routes leading out of West Berlin into FRG territory: to Hamburg via Nauen, Wittenberge and Schwanheide; to Hannover via Potsdam, Magdeburg and Marienborn; to Frankfurt am Main and Kassel via Potsdam, Bitterfeld, Jena and Probstzella; to Munich via Potsdam, Bitterfeld, Leipzig and Probstzella or Gutenfuerst.

The main route is the transit line via Magdeburg-Marienborn, on which eight pairs of express trains travel daily. In addition to this there are also two express trains and a local which head for stations in the GDR from West Germany (so-called alternating transportation). The border crossing in Gerstungen is also heavily traveled, namely the four pairs of trains in transit transportation and six pairs of express trains in alternating traffic between the FRG and Dresden use this crossing. Then there is also cargo transportation.

According to the railway guide, the transit routes have the following lengths in GDR territory: The Hamburg route is 225 kilometers long. Of these, 75 kilometers are single track. Not one of the kilometers there has electrical power. The route to Hannover travels 161 kilometers through the GDR of which 12 kilometers are single track (yet as part of the current negotiated deal, they should be expanded to two-track lines). Electrical power is provided on 8 kilometers (Magdeburg-Biederitz). The route to Frankfurt am Main is the longest route through the GDR at 349 kilometers. Of these, 50 kilometers are single track. The larger portion of the route, from Rosslau/Elbe to Neudietendorf to the west of Erfurt (182 kilometers) has electrical power; that leaves about 170 kilometers. The routes to Probstzella and Gutenfuerst are 321 and 300 kilometers long; but the same tracks are used up to Naumburg and up to Bitterfeld respectively as are used for the trip to Frankfurt am Main. In addition to the Frankfurt route, another 25 kilometers and 40 kilometers respectively should be converted into two track lines. Ninety-two kilometers and 61 kilometers respectively are to be provided with electrical power: the sections of Camburg/Salle to Probstzella and Reichenbach/Vogtland to Gutenfuerst/Hof. (But the connecting point to the FRG is not electrically operated.)

Since 1972, when the Basic Treaty was signed between the FRG and the GDR, the number of passengers traveling by rail to West Berlin has nearly doubled: from 1.4 million to 2.7 million in 1979. This enormous increase in passengers has been borne by virtually the same number of Bundesbahn and GDR Railroad trains; a maximum number of cars have been hooked up to the locomotives to compensate for the increased volume. Anyone who has traveled to or from Berlin in the past few months knows what it is like: the trains are generally overflowing.

Of the previously nonelectrified transit railway routes (710 kilometers), the GDR has its own profound interest in providing electrical power to about half of these (357 kilometers) because they are part of the main routes; Neudietendorf--Eisenach (44 kilometers); Potsdam--Magdeburg (112 kilometers); Naumen--Ludwigslust (135 kilometers) and Camburg--Saalfeld (66 kilometers). The GDR only has limited interest in the other routes important for transit railway service: for GDR train passage there is hardly any larger than is the transit passage. On the route from Potsdam to Beelitz eight pairs of passenger trains travel daily but of these nine are transit express trains. The situation is similar on the route from Magdeburg to Marienborn.

Because the increasing gas prices have contributed to the fact that the already overloaded railroad service to Berlin has to move even more passengers, additional trains will be necessary in any event. There is no debate about the fact that the GDR will provide more transit trains should Bonn participate in expanding single tracks to double tracks and in electrifying these lines; this would also mean shorter traveling times, making rail travel that much more attractive.

Whoever maintains that Bonn would be financing the GDR's rail infrastructure should be reminded that the GDR still has to electrify 6,400 kilometers of its main routes on its own if these important routes are to be modernized; the 700 kilometers, of which only one-half constitute main routes and for which Bonn would have to provide partial financial support, are a relatively small part in comparison. But even so, the GDR idea of having Bonn bear four-fifths of the expansion costs on the transit routes appears to go beyond the realm of reality.

9527
CSO: 2300

CROP, WEATHER REPORT PUBLISHED FOR FEBRUARY 1980

East Berlin FELDWIRTSCHAFT in German Vol 21 No 4, Apr 80 p 192

[Article by Dr D. Krumbiegel, GDR Meteorological Service, Central Weather Bureau, Potsdam]

[Text] The Weather in February 1980

Mostly above normal air temperatures, in the north often lower than in the south, were followed by cool weather at the end of the month. Up to the beginning of the first and at the end of the last 10-day period, there often was heavy precipitation, mainly in the form of rain.

Between 6 and 11 February, in the southern half of the GDR average daytime air temperatures ranged from 4 to 6K (partly up to 9K) above normal. From 2 to 4K values below normal were recorded generally around 27 February. For the rest of the time, the deviations from the norm mostly ranged between 1 and 3K. Daytime maximum temperatures rose from 5 to 16 February in the southern half, and from 20 to 25 February in parts of the entire area, to from 4 to 8°C (locally on several days up to 11°C). Otherwise, the maxima stayed below 5°C, regionally even below freezing. Up to 12 February, wider areas remained without ground frosts, even at night most of the time. Frosts around 5°C (locally up to 10°C) were recorded primarily in the time between 19 and 27 February. In the first half of the month, there was not much sunshine, but then, up to 25 February, sunshine became abundant. Altogether the duration of sunshine remained below normal in the northern half of the GDR, in the southern half it was about the normal average.

The most abundant precipitation came up to 7 February, proportionately increasing from north to south. Often there were, widespread, daily volumes of from 5 to 10 mm (in the mountains, 10 to 30 mm). Between 17 and 27 February, there was very little precipitation. The snow cover in the plains melted during the first 10-day period, from south to north. The depth of snow was around or below 5 cm, in the northern half of the GDR, around 7 February, locally between 10 and 20 cm. The snow in the high mountains was between 50 and 130 cm deep throughout the whole month. On 29 February another thin yet cohesive snow cover began to form in the southern plains.

Weather Data for February 1980 according to the Chief Climatological Office, Potsdam

1. Monthly Average Air Temperatures and Deviations from the Norm

Schwerin	-0.5°C	-0.8K	Erfurt	2.1°C	+2.3K
Neubrandenburg	-0.4°C	0.0K	Leipzig	2.6°C	+2.4K
Potsdam	0.8°C	+0.7K	Goerlitz	1.0°C	+1.7K

2. Average Precipitation according to Bezirke

Rostock	30 mm = 88%	Halle	28 mm = 90%
Schwerin	40 mm = 105%	Erfurt	42 mm = 105%
Neubrandenburg	28 mm = 85%	Gera	44 mm = 133%
Potsdam	38 mm = 119%	Suhl	71 mm = 139%
Frankfurt	32 mm = 103%	Dresden	53 mm = 126%
Cottbus	42 mm = 127%	Leipzig	38 mm = 112%
Magdeburg	35 mm = 106%	Karl-Marx-Stadt	53 mm = 108%

Average temperature in the three winter months (December 1979 to February 1980) in the plains of the GDR came to between -0.9°C (Neubrandenburg) and 1.2°C (Leipzig). That meant that the winter 1979/1980 was between 0.7K too cold and 1.1K too warm in comparison with longtime averages. The cold total (sum of the negative daytime average air temperatures) recorded at most stations showed values between 140 and 200°C, which means the winter was moderately warm. The precipitation sum total in the period between November 1979 and February 1980 was barely below normal in the coastal area and in the Halle region, but down to 30 percent below normal in the foothills of the Harz Mountains. In the rest of the area the precipitation totals were above average. South of the Schwerin-Angermuende line (except the southern kreises of Magdeburg Bezirk, the northern half of Halle Bezirk, the western parts of Erfurt Bezirk and Suhl Bezirk, and Karl-Marx-Stadt Bezirk) they went above normal by from 20 to 40 percent, in Cottbus Bezirk, by from 30 to 50 percent.

Soil, Crop, and Farm Labor

Temperatures clearly dropped in the surface soil, mainly between 6 and 18 February. In the southern half, values around 5°C were recorded at daytime. But the soil did not yet war up perceptibly. The subsoil temperatures were by and large constant and in line with longtime averages. By the end of the month, from 1 to 2°C were recorded at a 50-cm depth, from 2 to 3°C at a 100-cm depth. Frost by and large disappeared in the course of the first 10-day period, especially in the southern and central plains. Then the surface soil was temporarily drenched. Around 20 February, frost once again penetrated the soil. By the end of the month the frost depths mostly lay between 10 and 30 cm. Much of the precipitation of the first 10-day period was lost through surface runoff. Starting at mid-month, the weather dried the outer surface soil. Starting with 29 February, ground water recorded below the turf down to 50 cm in depth showed in most cases between 80 and 100 percent of usable field capacity. At the same point in

time, most recording stations reported for a depth down to one meter a ground water deficit between 5 and 25 mm on light soils, between 20 and 40 mm on medium soils, and between 20 and 50 mm on heavy soils.

Since the weather was mainly mild, vegetation found itself stimulated during the winter. Especially the winter rye showed some sprouting, but that stopped again when frosts recurred at midmonth. More sunshine thereafter and high temperature differences between day and night are likely to have stirred up crop vegetation considerably. The snowdrop blossoming at 20 February came circa 10 days too early. There was no trouble with any direct frost damage. But it is worth mentioning that considerable snow break damage did occur early in the month in the northern woods.

Up to midmonth there was hardly a chance for fieldwork. But then the frost helped make acreages trafficable so that fertilization measures were carried out (sometimes only on an hourly basis). Intermittent frosts, frequent in the last 10-day period, created suitable conditions for frost ground working and cultivation of the summer grain, mainly in Erfurt Bezirk. Large-storage and silo areas could be aerated almost every day.

Meteorological Projections for Farming in April 1980

The soil had been thickened by above normal precipitation in November and December last year and was subsequently exposed only for shorter periods to better friability conditions. It must thus be assumed that the soil will warm up relatively slowly and its absorptive capacity for rain is diminished. This attaches greater importance to measures that will improve the air budget. Nonetheless, great attention should be paid, in principle, to preserving ground water reserves as carefully as possible. As pre-winter development was often inadequate, the first nitrogen fertilization should surely be applied in time, particularly because the rapid drop in soil temperatures in fall greatly constrained the nitrogen mobilization. Furthermore it must be expected that weeds will become rampant rapidly since weed killers could not do much, which makes it necessary to apply mechanical and chemical measures against them at an early date. When it gets warm, vegetative conditions will produce rapid blossoming. This in turn will give rise to a greater risks from frosts, against which direct and indirect protective measures have to be prepared.

5885

CSO: 2300

ECONOMETRIC MODEL FOR SHORT-TERM PLANNING DESCRIBED

Budapest KOZGAZDASAGI SZEMLE in Hungarian No 3, Mar 80 pp 278-290

[Article by Laszlo Hunyadi, department head at the Research Institute for Computer Applications: "An Econometric Model for Short-Term Planning"]

[Text] Objectives of Modeling, Basic Principles for Developing the Model¹

The methods of short-term planning are less developed than, say, the methods of intermediate-term planning. To a large extent this also explains why mathematical planning methods based on modern computers have become a recognized and also methodologically substantiated element of intermediate-term planning, whereas in short-term planning the tools of mathematics and computer technology, based on input-output analysis, are used only in the coordination computations. Thus our primary objective in building a model was to undertake, also in the precoordination phase of annual planning, computations that would keep planners better informed and thereby would make the planning methods more effective.

In building our model we strived to adapt it to the peculiarities of the short-term plan and of short-term planning. These peculiarities--primarily from the viewpoint of modeling, of course--may be summed up briefly as follows. One of the most important characteristics of annual planning is its operational nature and flexibility. Which means that we must react quickly to changes in the economy's external and internal conditions; assessing the ripple effects of these changes, we must adopt economic-policy measures that will help to preserve or restore equilibrium, and to form the individual processes in a favorable direction. Naturally, this presupposes also that in the course of short-term planning we must monitor the development of the economy's principal indicators, process the latest information and, if need be, continuously modify the economic-policy measures as functions of the economic indicators and of the processed new information. In short-term planning the time available from the acquisition of the most important information--through its processing--to decision-making is too short, and this in itself necessitates the application of the modern methods of mathematical economics.

In addition to the already mentioned aspects that are mostly of a methodological nature, attention must be called also to another, substantive peculiarity of annual planning, i.e., to the fact that the possibilities of shaping and influencing economic processes in the short term are strongly limited. Specifically because the annual plan is in the nature of a program of measures, annual planning must explore in detail the foreseeable or desirable development of individual processes; it must reckon with an entire series of external and internal conditions that practically determine individual parts and sections of the plan, and failure to take these conditions into consideration could result in serious mistakes.

With the model we wished to aid the work mostly in the first, conceptual phase of planning, in formulating the initial concepts, and therefore our model is a predictive one. We strived to build a model that can be managed flexibly, one that is suitable for the continuous monitoring and correction of the results, as well as for performing ever-newer computations and preparing new variants, in accordance with the momentary problems.

Another important consideration was to build the model for planning's data base or a compatible data base, and to maximally conform to the methodological rules of short-term planning in terms of the model's detail, and of the investigated indicators' content and interrelations. From this consideration it followed specifically that we built a detailed, large-scale model at current prices and generally in an organizational breakdown (respectively by item groups in some instances). We took the already mentioned peculiarities into account also when structuring the model: on the one hand we wished to ensure the consistency and coordination of the computations by incorporating relatively many identities and balance equations; and in choosing the type of model and its internal dimensions, on the other hand, we strived to bear in mind that the annual processes were deterministic. Which in practice means that our model assumes (just as all economic models generally assume) that the structure defining the interrelations of the individual processes will remain unchanged in the future (the *ceteris paribus* principle), and that the processes which cannot be influenced in the short term (for example, the manpower situation) are treated as exogenous factors from the viewpoint of modeling.

And finally mentioned should be made of yet another peculiarity of modeling: we wished to approximate the process of planning with provisions to include, besides passive forecasts, also plans, objectives and feasible resources, making our model active in a certain sense. Thus the model's individual variants are suitable also for preparing forecasts in which the plan's pull is implicitly included, or which are suitable for analyzing the harmony of the plans and regulators (for example, of the financial regulators). In other words, the mentioned specifics of the model underscore that this is a planning model, which is supported also by the fact that the strict time schedule of national economic planning was observed in building the model.

Work on the model began in early 1977. By May 1978--the commencement of the first phase of annual planning for 1979--the model's first results,

the computations for 1978 and 1979, were ready. A new and improved variant of the model was prepared in mid-1978, utilizing the previous experience and also the final data base for 1977 and the report data for the first half of 1978. With the help of this variant, in September 1978 we prepared new forecasts and analyses of the foreseeable plan fulfillment in 1978 and of the principal trends of the processes in 1979. At the end of 1978--when the economic-policy directive for 1979 was already known--we repeated the computations for 1979², whereby we achieved our basic objective of building a "live" model, one that permits the continuous processing of new data.

Before describing in greater detail the structure of our model and the obtained results, we should mention briefly the methodological antecedents of this work, because many countries of the world have been building econometric models for decades. On this occasion I intentionally refer only to the experiments in socialist countries, because primarily these experiments are comparable with our work, in view of the similarity of the economic environment. In Hungary the models built at the Econometrics Laboratory of KSH [Central Bureau of Statistics] called attention to the feasibility of applying econometric models to the national economy [3, 4, 5]; in the wake of these models, several more econometric models were built [10, 11], some of them comprehensive [2], while each of the other models was concerned only with some partial question. Among the subsequent models we should single out the K-3 econometric model for intermediate-term planning [6], the first attempt to build an econometric model for the needs of planning. Among the socialist countries particularly Poland [9, 13], the Soviet Union [8], Czechoslovakia [19, 21] and the German Democratic Republic [15] built similar models.

A common feature of these models and of our model is that they investigate the economy's past interrelations and foreseeable future trends, by similar means and by modeling mostly similar structural interrelations. A distinguishing feature of our model is that while the mentioned other models are generally based on suitable statistical tools and provide statistical analyses, our model is based on the system of planning and takes into account this system's peculiarities and rules. Consequently, we had to build into our model many constraints that on the one hand make building the model more difficult, but on the other hand enhance the practical application of the results.

Model's Structure, Construction, Mode of Solution

In comparison with similar models, our model is very detailed and therefore large. For this reason we designed it as a two-level, partitioned model. For the aggregative investigation of the most important processes in the economy we developed a linear, dynamic econometric model of intermediate size, which we named the central partial model. It contains the combined values of the most important national economic aggregates, and only in describing the trade turnover did we employ a breakdown by principal provenances and destinations. The central partial model is characterized by relatively many identities (definitions) and balance equations),

by a wide circle of interdependent relations between the individual processes, and by the fact that the model not only describes the real processes but also takes into account the principal income processes and price development. The central partial model's structure is shown in the block diagram in Fig. 1 where the circles denote predetermined processes or variants, and the rectangles denote endogenous processes or variants.

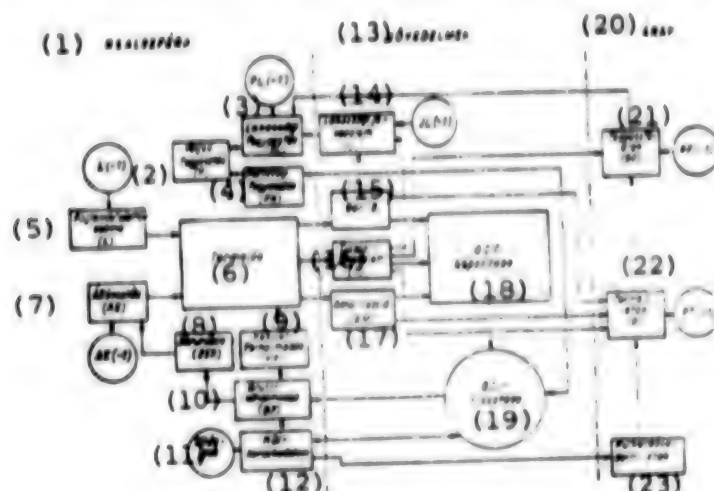


Figure 1. Block diagram of the model's principal interrelations.

Key:

- | | |
|----------------------------------|------------------------------|
| 1. Real sphere | 13. Incomes |
| 2. Final consumption (F) | 14. Population's income (LJ) |
| 3. Population's consumption (FL) | 15. Wages (B) |
| 4. Public consumption (FK) | 16. Net income (TJ) |
| 5. Employment (L) | 17. Depreciation (AM) |
| 6. Output | 18. Formation of GDP |
| 7. Fixed capital (AE) | 19. Distribution of GDP |
| 8. Investments (BER) | 20. Prices |
| 9. Inventory buildup (KF) | 21. Consumer prices (PF) |
| 10. Gross accumulation (BF) | 22. Producer prices (PT) |
| 11. World market | 23. Foreign-trade prices |
| 12. Foreign trade | |

Linked to the central partial model is a sectoral partial model that contains the equations for the individual spheres in a breakdown by sectors, respectively by item groups. For the sectoral breakdown we specified 12 sectors of material production, and an aggregated sector of nonmaterial production, but this breakdown has been applied completely only to the most important spheres. For the detailed investigation of the population's consumption and of foreign trade we used the commodity-group or item-group (CEMA) nomenclature employed in planning. The sectoral partial model is

a large-scale, dynamic econometric model that contains also nonlinear equations. Its significant characteristic is that the central partial model's results serve as input data for the sectoral computations, but there are no provisions for feeding back to the central level the indicators obtained by aggregating the sectoral figures. In other words, this corresponds to a planning and management system in which the central target figures are the authoritative figures, and there are no provisions within the model for verifying these figures at the lower level.

A model constructed in this manner can be a source of distortion, and distortions have been widespread in the case of similar models. However, the practical results indicate that the aggregation error, which characterizes the inconsistency of the sectoral and of the central computations, is very small, usually less than 2 percent.

While the sectoral partial model means that the central partial model is disaggregated in space, the quarterly computations introduce temporal disaggregation into the model. Although the methods of short-term planning do not prescribe quarterly or semiannual computations, for the most important processes of the national economy we prepared functions that describe their quarterly development. These functions enable us to continuously monitor and correct during the year the obtained annual forecasts, and to predict fairly accurately the foreseeable fulfillment of the plans; in the final outcome this makes the model more flexible. We described in an earlier article [7] the specific methods of the quarterly computations.

For the central partial model we developed also an optimizing mode of solution, which serves a dual purpose in the computations. First, by forming objective variables and resource variables, and by incorporating them in the model, we have made it possible to perform also analyses regarding the plans' foreseeable realization, the conditions under which this will occur, and the resources that will enhance realization. Secondly, the technique based on linear programming makes it possible to organically build into the model certain external informations and to measure the ripple effect of these external informations. The linear-programming task based on the econometric model's structure was described in detail, and also the analyses performed with it were presented in a separate article [12].

Besides the already identified elements of the model, we should mention also the supplementary computations that can take place only before or after the model computations in a stricter sense. These supplementary computations include the suitable development of the data base, the entering of the necessary corrections, determination of the exogenous variables' estimated values, including the upper and lower limits of the presumable changes, etc., respectively the computation of the indicators that are not modeled but are necessary for planning, the entering of subsequent corrections, the preparation of user tabulations, etc. Since on this occasion we are unable to dwell in detail on these supplementary computations, we merely wish to mention that most of them were necessary because planning's data base is still not entirely consistent with the system of published statistical data, even though the multiyear attempt to narrow the differences can be termed basically successful.

Thus the model, as we have seen, consists of an intricate system of partial tasks and partial computations, and this system is illustrated in the block diagram of Figure 2.

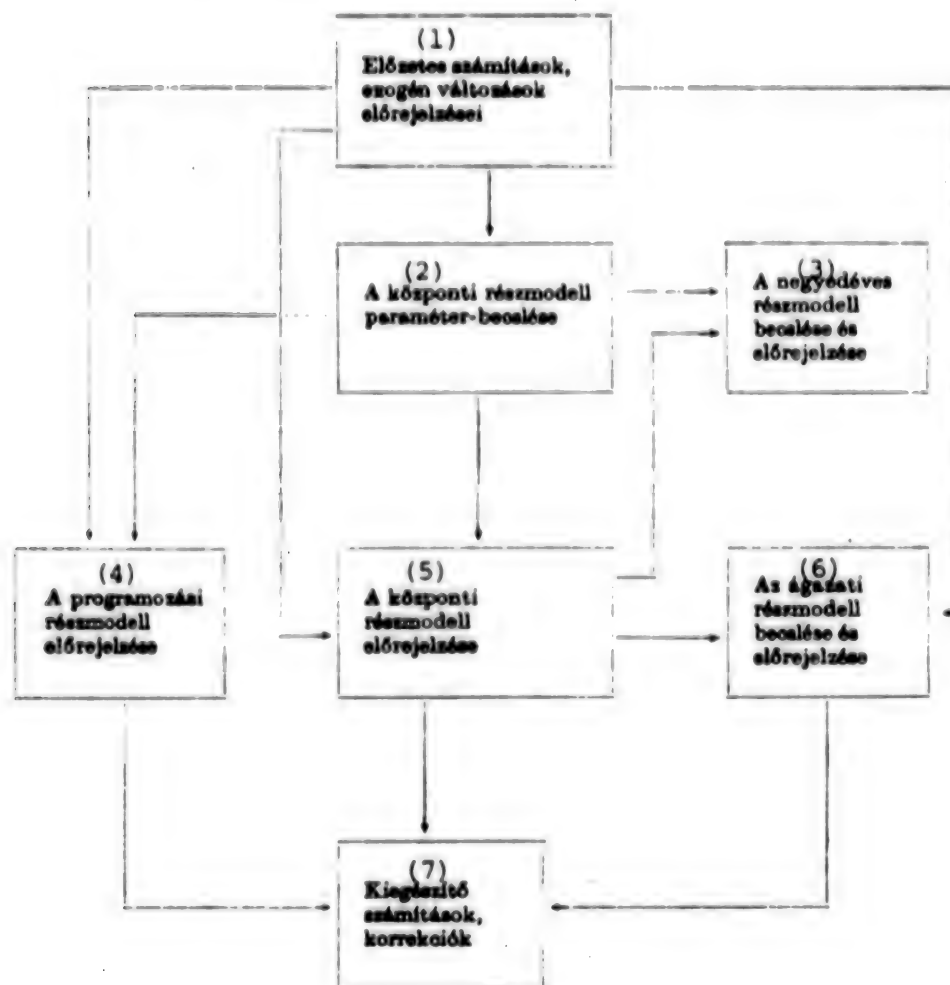


Figure 2. Block diagram showing the interconnection of the model's individual parts.

Key:

- | | |
|---|--|
| 1. Preliminary computations, forecasts of exogenous changes | 5. The central partial model's forecast |
| 2. Estimation of the central partial model's parameters | 6. Estimation and forecast of the sectoral partial model |
| 3. Evaluation and forecast of the quarterly partial model | 7. Supplementary computations, corrections |
| 4. The programming partial model's forecast | |

The model's data base includes the annual observations for the period 1960 through 1977, and also the quarterley observations for the period 1968-1977. In predicting the exogenous variables we relied partially on our own computations, and partially on the indispensable forecasts of the foreseeable external economic changes, which we received from KOPINT [Business-Cycle and Market Research Institute]. Thus suitable cooperation with KOPINT was an indispensable prerequisite for our work.

Although a description of the model should include also a description of the employed methods, on this occasion we will merely list them. For the estimation of the parameters we used the iterative least-square method, a particularly suitable and effective procedure for quantifying large-scale models [14]. We prepared the forecasts by using the traditional reduced form and linear programming. The large volume of computations in conjunction with the model was performed on the ICL System 4/70 computer at the OT [National Planning Office] Computer Center.

The Model's More-Important Computation Results and Their Evaluation

The model's computation results may be classified into three groups. First we statistically analyzed past interrelations, identified the principal factors influencing the investigated process, and developed the model's statistically relevant structure. In the following we will refer to these analyses, and to the principal conclusions drawn from them, as the base investigations. The next step in the series of computations was to prepare predictions and forecasts of the foreseeable future trends. And finally, the investigations performed with the model ended with analyses of the variants. The purpose of this was to assess the effects and consequences of the various phenomena and measures.

The results discussed here constitute only a small proportion of the results obtained with the model. In selecting the results for discussion, we took two aspects into consideration. First, we singled out the analyses and forecasts of those economic processes that are related to problems which, in the present economic situation, are in the center of attention and await urgent solution. Secondly, even though the model's statistical indicators are good also in the case of the sectoral computations, we present here primarily the results of the central partial model because these results are more reliable on the basis of the control computations that were repeated several times. We formulate mostly qualitative conclusions that are common in the case of slightly differing computations, and therefore may be regarded as acceptable. And finally, on this occasion we will not discuss the model's solution based on programming; we will evaluate these results elsewhere.

a. Base Investigations

Our most important experience in conjunction with the development of production--in the model we measured production as the value of the gross output, respectively as the gross national product--was that in a significant proportion of the cases the traditional approach (which explains the

development of production in terms of capacity) seemed more correct than the demand approach in which we took into account the demand for production (for example, consumption, export, etc.). In the case of the traditional production equations--in which the available stock of fixed capital, employment and, in our case, also the producer-price index are included as explanatory variables--employment appears with a negative sign. This in itself is still understandable, for in the case of stagnating or declining employment it indicates growing output, i.e., rapidly rising productivity, but actually it is unsuitable for causal analysis. Since the production equations are the most important equations of the econometric model, it seems expedient to thoroughly review the traditional econometric approach and to modify it in such a way that would yield the econometrically relevant macroeconomic interrelations with which the development of production can be described.

In the equations describing the population's consumption we found that the level of consumption attained in previous years was the determining factor of outstanding importance, so much so that the role of income changes and price changes is only secondary according to our model. Specification based on Friedmann's permanent income theory, which regards the previously attained highest permanent income level as the principal determinant of consumption, likewise proved unsuitable. (In the socialist countries, due to the steady rise of nominal and real incomes, this income level coincides with the application of an income variable lagged by one year.) This of course might stem from the fact that both incomes and consumer prices--the latter because of the relatively high degree of aggregation--develop too evenly, and also consumption is excessively aggregated in the model. Hence it follows that even though our model is suitable to reliably predict total consumption and consumption by item groups, special tools must be developed to measure the effects of price and income changes upon different population strata.

We investigated the development of the population's income as a function of wages and other allowances. In analyzing the wage equations we found that the lagged consumer prices exert significant pull on wages, but--interestingly--the price-boosting role of wage costs appears to be smaller than expected. One reason for this is the rather weak link between the development of consumer prices and that of producer prices. Thus, although the computations identify and even quantify the wage-price spiral in our economy, its rate is so small (a one percentage point rise in consumer prices will raise next year's producer prices by about 0.1 percentage point) that it may be neglected in the further analyses.

In investigating the process of accumulation we sought first of all to determine the extent to which fluctuations of the enterprise funds contribute to the existence of the investment cycle. An important conclusion of the analysis is that there is no statistically significant correlation, neither at the sectoral level nor at the level of the national economy, between suitable enterprise funds and the development of investments. Development of the investment cycle can be traced to deeper causes, including the fluctuations of foreign trade, the development of central subsidies, the

policy on inventories, and in general to the system of management. Our model was unable to pinpoint the causes in detail, but it did call attention to the fact that investment cycles must be reckoned with, and that the statistical econometric computations could be effective analytical tools.

Our most important finding regarding ruble-denominated foreign trade was that import is not geared so much to the needs of production or consumption, rather it follows the movement of export. This is a manifestation of the effect of the basically bilateral clearing system between CEMA countries. The joint movement of export and import can be traced also in nonruble-denominated foreign trade, and this can be explained primarily by the high import content of export (presumably higher than the import content of production for domestic use).

According to our model, nonruble-denominated import is influenced decisively by the development of the gross national product. In this equation the effect of the index of raw-material prices, which reflects the conditions on the world market, is weak; however, the cumulative balance of nonruble-denominated trade, which has been built into the equation to characterize the momentary foreign-exchange situation, plays an important role. The positive coefficient of the latter indicates that our increasingly accumulating (negative) balance of trade necessitates--through various linkages--the curbing of import; but since the value of this coefficient is much smaller than 1, this effect is weak and in the past it practically did not curb the rise of import.

In the case of nonruble-denominated export we attempted to model also the effect of export incentives (state refunds, trade-policy subsidies, tax rebates, etc.). The statistics of these variables did not develop as expected. On the basis of the obtained indicators we were able to conclude that actually the development of export influenced the subsidies, and not the other way around. In other words, the system of export incentives employed in the past regulated only subsequently, with delay, through the reimbursement of the incurred losses; but it was unsuitable to influence and form export in a planned manner.

Although we have listed here only a few elements from the results of our base investigations, they are sufficient to make obvious the general conclusion that development of the various processes in the Hungarian economy is too autonomous. In other words, due to the fact that the action of regulation is slow and not very effective, processes that are related or basically should be closely interconnected, actually develop independently of each other or adjust to each other only with significant delay; most of them have no or only very little feedback. This is reflected also in the 1978 trends discussed below.

b. Forecasts

With our model we prepared forecasts for 1978 and 1979. In this article we will describe in greater detail our forecasts regarding the development of the principal national economic processes in 1978, because tentative report

data for 1978 are already available, which provides an opportunity to evaluate the reliability of our forecasts.

In the first phase of quantifying the model (in May 1978) we prepared forecasts on the basis of a structure estimated by using the time series for 1960-1977. In September 1978 we performed new computations with the basic model, to revise and refine the forecasts. In the following we will refer to the results of these two series of computations as the May and September variants. In the refined September variant (using as a correction factor the difference between our forecasts for the first half of 1978 as compared with the quarterly equations, and the available report data for the first half of 1978) we prepared new estimates of how the annual processes would develop.

In the following table we summed up the more important results of the two phases of computation, showing also the corresponding plan data and the tentative report data.

Development of Some National Economic Indicators in 1978 (1977 = 100)

Indicators	Plan	Model's forecasts		Report (tentative)
		May variant	September variant	
Gross national product	107.5	111.9	109.2	109.0
Productive consumption	107.4	113.9	110.3	109.2
Value added	107.6	109.3	107.7	108.6
Depreciation	106.7	111.8	110.8	111.5
Net national product	107.8	108.9	107.2	108.2
Population's consumption	107.2	108.0	107.9	108.3
Gross accumulation	106.1	113.6	108.3	121.6
Of which: Investments	103.3	106.7	109.0	108.5
Inventory buildup	136.4	188.8	101.0	263.0
Wages and personal incomes	107.2	109.6	107.2	110.0
Profit	109.8	112.6	110.0	108.4
Net income	109.6	109.6	108.7	107.9
Total export	n.a.	110.7	101.5	100.9
Total import	n.a.	108.0	108.0	112.6
Balance of trade	n.a.	85.7	162.0	209.8

As evident from the above table, in both phases of computation our forecasts predicted somewhat higher growth rates for the principal national economic processes as compared with the report data. This stems primarily from the capacity-increasing effect of the high level of accumulation and productive consumption, which resulted in a sharp rise of the production variables (particularly of gross national product). The predictions of the corrected variant, in which the semiannual report data were taken into account, come much closer to the report data, although it is likewise evident that already the first forecasts prepared in May 1978 called attention to several very important trends departing from the planned trends (for example, to the disproportions of the accumulation process).

We must discuss separately the buildup of inventories. In the May variant we predicted a significantly higher inventory buildup than planned, nearly double the 1977 buildup. On the basis of consultations with planners, however, this value seemed entirely unrealistic. Therefore we modified the model's specification and in the gross-accumulation equation we substituted the value added, for the rapidly growing gross national product. As was to be expected from the model's logic, this led to lower gross accumulation, and to lower inventory buildup as gross accumulation's residual item. Events confirmed that the original forecast was the more correct. In the future we unquestionably must strive to write an equation for inventory-buildup behavior, because on the basis of our results it is evident that it is by no means suitable to treat inventory buildup as a residual item.

On the whole our model's forecasts for 1978 reflected the real processes correctly; departures from the report data can be explained in every case. Our results called attention to the fact that 1978 played a peculiar role in our economic development. On the one hand growth was rapid but unbalanced, and this brought to the surface the problems without whose solution further growth and stability cannot be imagined. On the other hand our model's forecasts for 1979--on which we will not dwell on this occasion--demonstrated that even under the conditions which developed in 1978 it is feasible to revert to a course that may be regarded as being in equilibrium.

2. Variants

The situation that developed in 1978 stemmed in large part from the inertia of the individual economic processes, from the inadequate effectiveness of regulation (for example, the annual plan called for reducing the volume of investments!), and finally from a coincidence of random factors (of the investment surge, and of the worsening terms of trade). The questions that arise in this critical economic situation cannot be answered within the framework of such a model. To a certain extent, however, also our model was suitable for investigating the causes of this situation, and the foreseeable effect of the measures adopted to solve the problems. For this purpose we worked out variants, of which we will single out only two on this occasion.

One variant sought to determine what was the principal cause of the critical situation that developed in 1978. The other variant investigated what kind of restrictive economic policy and what formulation of the 1979 annual plan would enhance the realization of the principal objectives. With the first variant we analyzed the situation that would have developed if investments in 1977 had conformed to the plan, instead of increasing at a rate about 10 percentage points higher. In the second variant we assumed a planned slowdown of economic growth and domestic expenditure; here we investigated what growth rates would have resulted from these assumptions, particularly in relation to foreign trade and the balance of trade.

Combined investigation of these two variants revealed that the principal cause of the very critical disequilibrium in 1978 was the surge in investments in 1977. Had investments conformed to the plan in 1977, output in 1978 would have been lower by 1.2 percentage points; investments, by

3 percentage points; and import, by 7 percentage points. The effects of the outstandingly high volume of investments in 1977 were manifold. The surge carried over into 1978, and therefore the volume of investments was high also that year. The investments created a series of new capacities that made possible the expansion of production at an accelerating rate. The investments themselves, as well as the new capacities created by them, generated such an additional import demand that made our balance of trade critical also according to the computations, and even more critical in practice. The problem was further aggravated by the fact that the import demand of export is also rising, and hence the expanding export capacities necessitate new import.

The computations also showed that the 1977 investment surge would become more moderate by 1979 and also its ripple effects would subside, and thus 1979 would unquestionably be a good year for directing the processes into their proper course.

The mode of accomplishing this was preceded by lengthy debates; we merely wish to point out that, according to our computations, an accelerated rate of economic growth would only intensify the existing problems, and thus in the short term a restrictive economic policy unquestionably seems expedient, but we must mention already here that in the long run a restrictive economic policy is unsuitable for achieving the long-range objectives in developing the economy. The computations performed with the second variant indicate that such an economic policy--taking into consideration the favorable trends for 1979, stemming from the inherent laws of the economic processes--would be very advantageous from the viewpoint of foreign trade and of our balance of trade. According to our computations, fulfillment of the principal tasks [20] would mean a 12.2-percent increase of our export while our import would remain at the 1978 level, whereby the balance of our non-ruble-denominated trade would change favorably.

However, we must clearly see that this favorable change, although significant, is only relative, and that in practice it creates for 1979 the same situation that would have arisen without the harmful trends of 1978. In other words, this economic policy and these measures can only serve to remedy the disturbances of 1978, but they are unable to solve our lasting structural problems. And since the economy's structure cannot be transformed, and its flexibility cannot be increased, under stagnating or slowly growing output and accumulation or import, it seems that in the long run a restrictive economic policy would hardly lead to the desired result. Thus the measures to resolve the momentary problems, and the requirements of long-range development are in conflict--also in terms of the growth rate--but the solution of this problem can hardly be expected from a short-term prognostic model. However, this model can have an important role in assessing the consequences and foreseeable effects of real alternatives that will be developed through economic analyses.

Summary

Our socialist economy needs systematic analytical and evaluating forecasts--particularly in the present uncertain environment of the world economy--

because without them economic management would be able to react to the arising problems only with a certain delay. And delay in regulation undermines effectiveness. The purpose of these forecasts is primarily to pinpoint--after exploring the future development of the economic processes, in conformity with their internal laws--the areas where central intervention is necessary. The forecasts can be truly good when the model-builders are familiar with the aspirations and measures of economic management. On this basis it can be said that close cooperation among model-builders, planners and economic management is an essential prerequisite for the elaboration of reliable forecasts and their appropriate utilization.

On the basis of our model-building experience we may say that the economic processes in our economy enjoy relatively great autonomy. Random developments in time show definite trends, and thus our time-series modeling generally leads to good results. However, interaction between individual processes is relatively weak, and this must be taken into consideration when structuring the model. This is an important characteristic of the socialist economy's econometric model.

On the basis of our first computation results it is possible to map the tasks with whose solution computations of this type can become useful tools of planning and economic management in the future. First of all it is necessary to develop further the basic research in economics on which model-building is founded; the supply of data must be improved; research into methods for the partial tasks must be continued; and computerization must be developed. Already the first results of our model, the ones outlined in the present article, indicate that also in a socialist planned economy econometric models--constructed with due consideration for the special requirements--are useful additions to the tools of economic analysis.

FOOTNOTES

1. The model was built in cooperation with the National Planning Office's Economic Department, and the Econometric Department of SZAMKI [Computer Technology Research Institute]. The model's methodological elements, data base, the problems of its structuring, and the results of the computations to date are contained in several workplace reports [16, 17, 18]. Judit Nemenyi, Peter Subicz and Andras Fiala collaborated in building the model. Povilaitisz Szigitasz, Csaba Nagy and Laszlo Domotor assisted us in performing the computations.
2. These computations were not a part of the cooperation between the National Planning Office's Economic Department and SZAMKI.

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EFFICIENCY OF MACHINE INDUSTRY PRODUCTION ANALYZED

Budapest FIGYELO in Hungarian 12 Mar 80 p 5

[Article by Dr Arpad Kovacs: "The Efficiency of Machine Industry Production"]

[Text] Efficiency in machine industry production has increased in the recent period, and its level exceeds that of the industry as a whole. Its contribution to the national income created by industry has reached 35 percent. However, the efficiency of its activity has not developed to the degree justified and necessary in light of tightening manpower sources and the relatively important expansion in capital means supply.

For the machine industry the basic task in the coming years will be to create, by building on the qualitative and efficiency factors of growth, the restoration of equilibrium in machine foreign trade and the conditions of its constant improvement. Regarding the modernization of the structure of machine industry production and the expansion of integration see Istvan Lendvai's article in FIGYELO No 8, 1980.

One of the basic sources for the improvement of economic efficiency is an increase in work productivity, and therefore it is also a condition of the intensive development of the machine industry. In recent years--essentially as a consequence of the unchanged manpower situation--productivity growth has become the source of expansion also in the machine industry. The level of machine industry productivity, however, is still below that of the international vanguard, as well as below that of countries similarly developed as our own.

In the coming years machine industry production can be increased, it may be expected, with a significant reduction in the number of employed. To assure development will require an increase in work productivity, an improvement in the efficiency of live work, or the realization of such a development policy and incentive as will promote the creation of harmony in supply and demand for manpower. One of the most important problems of further development is the most purposeful and efficient use of available manpower.

More Rapid Adjustment

Structural changes in the machine industry must be followed by planned manpower shifts, and in the course of production we must take manpower sources more realistically into account. We must survey in advance the various tasks related to manpower regrouping.

Stresses in the employment situation cannot be ended exclusively by manpower management. Realization of the requirements must be supported by the whole of political and economic activity. It is particularly important that guidance, planning and regulation--primarily with the modernization of the structure, the basic surveying of manpower demands, and the improvement of plant and work organization--should maintain demand for manpower and its structure at a realistically attainable manpower level.

In the future, establishing of new work places and furnishing them with manpower will require the elimination of shops that are obsolete and uneconomical in production, and the employment of the released manpower in more efficient areas.

There is an important internal manpower source to be found in the reduction of the high proportion of support and service activity and transfer of released manpower, after appropriate training, to other productive areas. In the machine industry there has been an unfavorable trend in the ratio of workers engaged in basic and support activities. The ratio of physical workers engaged in basic activities has declined in the past 5 years by about 3 percent. The number of those employed in support activity is about 124,000, close to 40 percent of the physical workers!

About 40,000 workers in the machine industry are engaged in the movement of material (delivery, storage, internal material movement, warehouse work), and its reduction also represents a significant manpower reserve. Only about one-third of the material movement is mechanized. Mechanization in this area, coordinated with the basic production processes, will make possible a considerable shift of manpower.

Twenty-six percent of the support force is engaged in repair-maintenance activity, 42 percent in other nonindustrial activity. The expansion in fixed assets has increased the repair and maintenance demands. The average obsolescence of machines in the machine industry is 40 percent. The repair-maintenance manpower within the machine industry is highest in the metalware industry (32 percent), and this also points to the greater obsolescence than average of the machinery.

At present there is a lack of appropriate harmony between the number of work places and the available manpower. The number of machine work shops exceeds by 60 percent the number of those engaged in machine work. On the enterprise level we find at the same time manpower shortages and surpluses. The solution to these stresses may be found in the framework of manpower management coordinated with structural development.

Capacity Reserves

In 5 years (1972-1977), the ratio of machine workers in the machine industry increased by 11 percentage points. At present 45 percent of the physical manpower works on machines. This ratio does not equal the 50 percent ratio which has developed in industry as a whole--basically because of the nature of the technology. The ratio of fully automated activities in the machine industry is low (4 to 5 percent). We can find additional reserves by increasing the ratio.

In respect to live work, the exclusive source for increasing machine industry production is better utilization of work time. The utilization of available work time is about 80 percent. Significant differences are in evidence among the sub-branches; the index is most favorable in the sub-branch that manufactures electrical machinery. The greatest ratio of loss stems from the manpower situation and repair-maintenance problems but there is also a significant loss due to shortage of orders.

The productivity increase reserve is also to be found in the better exploitation of the increase in the number of shifts in the work time available. In the machine industry the number of shifts has been stagnant for some time at 1.2 to 1.3. There is a greater number of shifts (1.5) for about 20 percent of the machines whose age is between 0 to 5 years and less in case of equipment more than 15 years old. Exploitation by shifts of modern, high-value and high-performance machinery has increased in recent years, but even so it comes to no more than 1.6 to 1.8 shifts; in this area the possibilities are not yet exhausted.

On the basis of performance requirements, the ratio of workers in recent years has increased. In 1975, 50.4 percent of the physical workers and in 1977 almost 55 percent worked on the basis of work norms and other performance requirements. This was realized in a differentiated way among the sub-branches, in the sub-branch for transportation vehicles the ratio was higher --63 percent--while it was only 50 percent in communications technology and metalware. We must increase, in harmony with the development of techniques and technologies, the ratio of those employed under performance requirements, and reduce the amount of lost time.

Work productivity increase requires of the enterprises that they improve work and factory organization. It is an encouraging fact that more and more machine industry enterprises are becoming familiar with modern organizational procedures after the introduction of which productivity increases significantly. But the results achieved in this area are modest, and the remaining reserves are still great. Therefore we need to ascribe great importance to organization, the adherence to and the extension of good examples.

It would be possible to free significant manpower reserves by improving the rhythm of machine industry production. The fluctuation of production levels annually or monthly--stemming basically from material supply and cooperation interruptions--continues to be important. Production in the year--end

months comes to twice as much as in the early months. This causes important losses because the occupied manpower is adjusted to work peaks and thus in those months when production is reduced, the manpower cannot be used. In this area, results can be attained by regular deliveries and the development of cooperation.

Investments and Means Utilization

Investments set into operation in the past year and a half represent about 17 percent of the industry's investments. Important developments and investments were realized generally with greater expenditures than planned and with extended implementation time. The modernization of the production structure and investment activity were intensified to create an export commodity base. In the Fifth Five-Year Plan period, 70 percent of the investment expenditures were used for the development of 21 product groups designated for dynamic development, although we are still carrying out significant investments in areas designated for stagnation and retrodevelopment.

It is characteristic that in certain areas the level of mechanization in the producer processes is high and the most modern pieces of equipment can be found, while in other areas the degree of mechanization is not adequate. All in all, it is characteristic that the age of the machines is high, 33 percent of the machinery and equipment is as high as 25 years. A significant ratio of the machinery and equipment does not come with automatic operation.

The large-scale obsolescence of the fixed assets, machinery and equipment is related to a low, unsatisfactory rate of discarding. There has been a progressive increase in the ratio of machines still operating that are written off at zero value, and comes to about one-third of the value of total machines. Enterprises are spending more and more on the repair and renovation of obsolete fixed assets.

In the future we will have to devote greater attention to the factors that influence demand for means. An important area for the reduction of expenditures is to be found in the economical management of fixed assets and machinery. We must concentrate investments on increasing economic and rapidly convertible, commodity bases, and on developments that replace imports in an economic way. In addition to investment work, the requirement for efficiency improvement directs our attention to the optimum exploitation of existing capacities. In this field the possibilities are great, for the fixed assets of the machine industry are about six times as great as the annual investment possibilities.

Machine industry enterprises must continue to follow those possibilities (material organization, work distribution, etc.) which will make it possible to increase existing capacities through better exploitation and

without more significant investments. The basic method of doing this is plant and work organization, minor developments aimed at eliminating bottlenecks in the production process, and planned production running in time for new capacities. The technical development of producer equipment in the machine industry would make it possible in a number of areas to manufacture products which are more valuable than those at present, more exportable, and more capable of saving on imports. Therefore, it is important that the enterprises speed up the modernization of their product structure, uncover and use their efficiency reserves.

More Economic Material Utilization

The material and energy demands of the machine industry show a declining trend to a minor degree, while in production the ratio for the less material-intensive communications technology and equipment industry has increased in recent years. At the same time, for most of the machine industry products, material consumption is greater than justified. The material yield is not adequate (about 75 percent). This can be ascribed to technical and material quality reasons, the dimensional inaccuracy of the prototype products and a low technological level.

In the past decade, the material ratio of production has not declined to a significant extent, and at present it is about 62 to 63 percent. Therefore it is an important task to reduce the material intensiveness of production. We have considerable possibilities in this area. A significant share of our products are too heavy, something which is not acknowledged in world market prices. We have additional possibilities in increasing the degree of processing of our products. The economy of material consumption can also be increased by raising the performance level of the equipment, and the technical level.

In recent years there has been a significant increase in the import material content of machine industry production. We are still not realizing rational import savings adequately, and import replacement activity is developing too slowly. In the machine industry specific material consumption can be considerably improved with the development of techniques and technologies, and with increased economy. Of particular importance is the economic utilization of imported basic metal materials and of semi-processed products. In material management we must put greater stress on studies of material requirements, their comparison with international practice, and on the preparation and realization of specific branch and enterprise material savings programs.

Unfavorable trends are also evident in inventory management. Contractual discipline is not adequate, deliveries are undertaken by the suppliers only for a long period of time, the consumers keep large stockpiles, the TEK [Capital Equipment Marketing Enterprise] inventories are lower than they should be, and thus they can meet their "fast service" role only to a small

extent. In this area, the main task is a worthwhile improvement in inventory management, solidification of the delivery discipline, and development of cooperation among enterprises.

With the Help of Science

Closely related to selective development is the extent to which the machine industry uses the results of scientific research and technical development. The enterprise bent is not too great, and in this field the machine industry must make faster progress.

In recent years an improvement has been evident in taking over and using foreign research results. For the manufacture of products that must be developed more efficiently and rapidly, the machine industry purchased on a yearly average about 70-80 licenses, and most of these licenses are used in this same industry. In the future we will have still greater need for the further concentration of the material and intellectual sources of the machine industry, the improvement of the quality factors of production, the development of the technical level and modernity, and the economy improvement of production. Competitiveness on foreign markets must also be promoted by linking development, production and marketing functions.

Realization of structural development and modernization tasks to improve efficiency is restrained by the low level of background industrial production. This lag limits the mobility of other enterprises and makes it more difficult for them to adjust flexibly to market requirements. We must also develop the processes linking production one to the other, and part and component manufacture linked to the final product. With an improvement in the chain of the machine industry enterprises, efficiency reserves will be formed and used. Significant savings can be achieved with the expansion of work distribution and the improvement of cooperative activity.

Efficiency improvement poses every managing unit with the task of improving achievements through the economic use of resources and their rational combination. The enterprises must hold their position in "cost competition" by realizing the economy requirements in their complex interrelationships. This is a complex task which consists of developing a modern production structure, increased organization, improvement in manpower management, better exploitation of work time, speeding up of technical development, and the establishment, use and improvement of more efficient capacities.

6691

CSO: 2500

CSIKOS-NAGY DESCRIBES HIS NEW BOOK ON PRICE POLICY

Budapest MAGYAR NEMZET in Hungarian 15 Mar 80 p 5

[Article by Judit Racz: "For the Equilibrium of Supply and Demand"]

[Text] The price adjustments introduced in July of last year mark the commencement of a type of change in Hungarian price policy that has been unprecedented in practice up to now. Naturally, everyone is interested in how prices will develop from now on; and specifically because this is a newly started process, it is obvious that its essence is not clear to many people.

"A Magyar Arpolitika" (Hungarian Price Policy), a book by Dr Bela Csikos-Nagy, arrived at the bookstores with a freshness that is unusual for the Hungarian publishing industry. The book expounds the causes and antecedents of the 1979-1980 price adjustments.

We asked the author, who is chairman of the National Office of Materiel and Price Control, how he came to write this book.

"At the request of the Publishing House for Economics and Law. The publishing house truly took into account the foreseeable interest in the book, and the need for clarification. The question that intrigued me at the writing was the feasibility of introducing price adjustments and of simultaneously formulating them theoretically. Our economic policy has been continuous since 1957. This is what I wanted to present in detail, and also the conclusion that the 1980 price reform is a necessary link in this process. There have always been false value judgments regarding the distortion of prices, and therefore it seemed expedient to present the Hungarian economy and price policy in their interrelations.

"The book has indeed been written with unbelievable freshness: it reflects the situation that existed on 1 January 1980, of course on the basis of the data then available. We updated the data practically until the last minute. Naturally, what is happening in 1980 is not included in the book, but the book does call attention to all that can be expected and to what we must adjust."

Signaling System

In a socialist economy the national economic plan is best able to make perceptible the course of economic development. Hungarian economic policy wishes to gradually restore in economic growth the equilibrium of our balance of payments that has been disrupted by the worsening terms of trade. Starting out from this very important statement, the author concludes that the price system's development necessitates perfection of also the other elements of the system of economic management.

An economy functions smoothly if exactly the socially necessary quantity of everything is available everywhere. Therefore many persons regard technical-material organization the most important, if not the sole, condition of a socialist planned economy. Technology and the economy organically determine each other; one is no substitute for the other, nor is one able to dispense with the other. Economic decisions are worthless without a real material-technical base. In the case of commodity production, need assumes the form of demand, and production assumes the form of supply. Demand is the quantity of needs regulated by means of prices; and supply is the quantity of production regulated in this manner. Therefore commodity production can have no comprehensive signaling system other than prices.

Discussing our price system, the book's author emphasizes that prices and their real role can be defined only in the sociopolitical-economic environment in which they exist. In recent years, references have become more and more frequent to the fact that the CEMA market is "hardening." By this is meant that the technical parameters of the products, and even the terms of supply within CEMA, are coming closer to the norms applicable on the world market.

Debates on Price Level

The 1979-1980 price adjustments are a part of an economic process. Bela Csikos-Nagy points out the following: Price policy has anticipated already since 1957 that prices would have to be changed when warranted, and that in most cases this would mean a higher price level. In this work [of updating prices] it was assumed initially that primarily the price ratios were significant under an economically defined price system, and that in forming these price ratios it was necessary to take into consideration also the relative scarcity of the products. In the period 1957-1967, plan-conforming price development was still identical with official price regulation. Only in the mid-1970s did attention focus increasingly on the problems arising from the economy's foreign-trade sensitivity. At that time it became evident that if the domestic market was small and vigorous growth could be achieved only through intensive international division of labor, then also economic effectiveness could be judged only on the basis of international competitiveness. However, suitable signals for this can be ensured only if domestic prices are organically linked to foreign-trade prices.

From 1957 through 1958 wage policy was the principal tool of the policy on the standard of living. These years convinced economists that the harmony of supply and demand could not be ensured through a policy of frozen prices. Parallel with the development of the productive forces, there is a constant reassessment of the products and services. These trends are generated not only by world-market price effects, but also by changes in technology and productivity. In the case of demand, changes in life style, incomes and fashion are contributing factors. In addition to all this, seasonal production, weather fluctuations and the perishability of goods also play a price-regulating role. Experience--at least in Hungary--indicates that under official prices "carved in stone" it is unrealistic to expect that enterprises will adapt flexibly to the changing structure of demand. Furthermore, disturbance-free commodity supply can hardly be imagined if demand cannot be influenced through prices.

The debates on the price level reached a new phase in the late 1970s. By then world-market inflation accelerated, and the domestic prices' rate of rise became a function of this acceleration. The debates on the price level are still going on, but there is a consensus among the contributors that we must unalterably expect a rise of the price level in 1981-1985, i.e., during the period of the Sixth Five-Year Plan.

In Harmony With Economic Policy

The price system's further development can be imagined only as an integral part of this economic-policy process, supplemented by the requirements set by time. The resolution that the MSZMP Central Committee adopted in 1979 regarding the principles for the price system's long-range development may be summed up as follows: our price system must be in harmony with the requirements placed on economic policy, and the role of prices in influencing sound economic decisions must be reinforced. The resolution outlines in five points the directions of the price system's long-range development: domestic and world-market (foreign-trade) prices must be organically interlinked; a two-level price system must be developed (under which society's net income is realized mostly in the form of turnover tax on consumer goods, the difference between the producer-price level and consumer-price level); the net-income structure of producer prices must be developed; the consumer-price system must be developed; and our price system must be made more flexible. The requirements that consumer prices must meet are as follows: they must enhance development of a consumption structure that is in agreement with the interests of society; they must contribute toward balancing supply and demand, toward modernizing the structure of supply and its adaptation to the structure of demand; they must provide sound guidance for the development of production, for central planning and regulation; and they must serve as effective tools of the policy on the standard of living.

3.7 Percent

The book's author dwells in detail on the producer prices of basic materials and finished products under the new price system, and he analyzes also

the prices of commodity circulation. He emphasizes that the components of the price level's rise in 1980 are basically different from the components in 1979. He quotes from the resolution of the MSZMP Central Committee: "As a result of central measures and other price movements, in addition to the carried-over effect of the 1979 price increases, the consumer-price level may increase by about 3.7 percent." Through the measures adopted in July of last year it was possible to achieve that in 1980 adjustment of the consumer prices to the producer prices could occur with a rise of the price level kept within 1.0 percentage point. A further rise of 2 percentage points in the consumer-price level stems from market factors, in the area of free prices. And finally, the consumer-price plan contains also a reserve for adapting to the foreign-market prices.

Just now we spoke of a price plan. This word underscores what the chairman of the National Office of Materiel and Price Control emphasizes also in his book: prices may rise only within the specified limits, but arbitrary and unjustifiable price movements are entirely out of question. Under the new price system the function of the statutory ban on unfair profit has changed; it now applies primarily to a violation of the statutory provisions concerning pricing. The government has entrusted to the National Office of Materiel and Price Control central management of price control. It will be prohibited also in the future to charge, demand or accept for commodities a price higher than the official price of the obligatory price. Price audits will be conducted within the same organizational framework as before, and the authorities will be more forceful in bringing price gougers to account.

1014

CSO: 2500

FOREIGN TRADE JOURNAL COMMENTS ON OPEC AID TO ISLAMIC COUNTRIES

[Editorial Report] The Warsaw HANDEL ZAGRANICZNY in Polish in Issue No 11 of 1979, pages 39-40, carries an article by Jerzy Zelislawski which briefly reviews the OPEC States' assistance to, and the economic development of, Islamic countries with references to the Islamic Development Bank and the Arabian Bank for Development of the Countries of Africa (BADEA). The author concludes his presentation by stating that "in assessing the period between the preliminary analysis of the needs and allocation of aid and the very moment it is granted, it must be admitted that the OPEC countries acted swiftly and decisively. The customary phases employed by the Western countries--analysis, preliminary promises, commitment, and the granting of aid itself--were skipped over. This undoubtedly reduced the costs of the credit, especially in cases where it was used up for the purchase of capital assets which have a strong rate of price increase. This system, however, did not protect itself against many errors in the technical-economic assumptions and general mistakes with regard to the correctness of the implementation of the projects. As a result, installations sprang up, especially in the machine-building industry sectors, with a negligible utilization of the productive capacity caused by the lack of harmonious development of the cooperating industries, large import-absorptiveness of production, and lack of trained cadre. This pertains also to projects implemented on bilateral principles and without the participation of specialized international agencies or advisorship on the part of the aid agencies of the industrialized countries.

"In sum, the OPEC countries' assistance to the Islamic world is the basis of its [the latter's] further economic development, the 'reparation' of payments balances, and a certain compensation for higher costs of crude imports. This assistance is also an intrinsic integration factor of the Islamic countries."

EFFICIENT USE OF FARMLAND STRESSED

Warsaw SLOWO POWSZECHNE in Polish 20 Feb 80 p 1

[Commentary by (Mel)]

[Text] It is predicted that during the next five-year plan approximately 4.5 million hectares of farmland will change hands. It is expected that this process will reach its peak right after the new pension law goes into effect, that is, during the course of the next two years. It is estimated that out of a total of 3 million private farms, 320,000 to 350,000--with a combined area of 1.2 to 1.5 million hectares--will be passed on to heirs, while approximately 150,000 hectares will be deeded to the state.

However, this issue needs to be examined in light of the fact that every 3 years more than 100,000 hectares of farmland are taken out of production, while during the same interval the population increases by more than 1 million. In 1960 there were 0.61 hectares of farmland for every Polish citizen, whereas today there are only 0.51 hectares of farmland per capita. The official records on these lands include more than 400,000 hectares which for various reasons have very little to do with the pursuit of agriculture.

As we all know, concern for the land resulted in the passage of legislation on the protection of farmlands. Nevertheless, large areas of farmland, oftentimes prime farmland, are being taken out of production, since they are being set aside for nonagricultural purposes. Edward Gierek spoke about this at the party's 8th Congress: "We must use every hectare of farmland to the best possible advantage, step up our efforts aimed at the reclamation of farmlands, and wage a resolute struggle against the takeover of farmlands for nonagricultural purposes." Many hectares of farmland have gone out of production during the time it takes to acquire land from farmers or to transfer it from one sector to another, a process which sometimes takes a couple of years.

So the basic question facing us is this: to whom should the land be transferred and how in order to insure a high and uninterrupted level of production?

The pension law makes it possible to transfer land to one's heirs. But in the Politburo's platform report read before the 8th Congress it was pointed out that farms passed on to heirs should wind up in the hands of qualified young people who will promise to use it and specialize in its cultivation. This is in line with the public interest. For if we assume that all of the land that is being transferred equals 100 percent, then approximately 65 percent of the total number of farms and around 70 percent of the total land area is actually being transferred to heirs.

Based on the record of past experience it turns out that the transfer of land to heirs is still the cheapest and the best way to insure its high productivity. But this has to be handled in an efficient manner with provisions being made for the readily available option of trading or consolidating lands and for appropriate deliveries of capital goods so as to create increasingly more favorable conditions for farmland management.

The next important issue has to do with the process of selling and leasing lands to farmers from the State Land Fund. Major improvements need to be made in the methods used to determine the criteria that govern this process. The formalities that attend this process must be dispensed with in short order and not be allowed--as they now are--to drag on for years and years. For in many regions of the country the demand for farmland on the part of farmers is very high. Whereas in 1975 14,000 hectares of farmland were sold to private farmers, in 1979 this figure climbed to 100,000 hectares. But, all in all, this increase is still not great enough to satisfy the demand.

A third problem has to do with lands taken over by the state. There are some regions in which it is impossible to find anyone else to cultivate the land. This procedure entails not only high costs (to take over 1 hectare of farmland and bring it under cultivation costs approximately 200,000 zlotys), but also runs counter to efficient farming practices. It would seem that land deeded to the state ought to be consolidated or traded beforehand so as to avoid situations in which fields tilled by private farmers are divided by a few dozen areas of land cultivated by cooperatives, agricultural circle cooperatives, and state farms.

Land should be made available as soon as possible to those people who promise to bring it under cultivation in the best, fastest, and least costly manner. We realize that the elaboration of such a system is no simple matter. But this is something that must be done and it is a basic precondition to the successful implementation of the program for the development of the food producing sector of the country's economy.

11813

CSO: 2600

BRIEFS

PIOTRKOW TRYBUNALSKI EXPORTS--Of the 45 plants in the Piotrkow [Trybunalski] Voivodship turning out production for export, 20 belong to the Piotrkow Exporters' Club. Last year they produced goods valued at 465.5 million foreign exchange zlotys. In club competition, the first place was held by the "Komuna Paryska" industrial plants in Radomsko, which had production valued at 100 million foreign exchange zlotys. The second place fell to the "Opoczno" Wool Industry Plants, and the third to the "Hortensja" Domestic Glass Works (HSG) in Piotrkow. This year the value of products manufactured for export by the plants of Piotrkow Voivodship will amount to 501 million foreign exchange zlotys. [Text] [Warsaw GLOS PRACY in Polish 28 Mar 80 p 3]

ROLIMPEX EXPORTS--Above-plan foreign exchange revenues are obtained also through expanding the export list by new, additional items and also, in effect, negotiating more advantageous prices for goods--higher for goods exported from Poland and lower for those imported to Poland. It was just such a task which the employees of the ROLIMPEX Foreign Trade Agency in Warsaw placed before themselves as an anniversary obligation in honor of the 35th anniversary of the Polish People's Republic. The preliminary summation of the results of this ambitious obligation, implemented by the employees of the ROLIMPEX commercial offices, is that as a result of greater discernment in concluding domestic trade fairs transactions, they obtained for the enterprise above-plan foreign exchange revenues in the amount of over 3.3 million foreign exchange zlotys. While due to more skillful canvassing, the employees of three commercial offices, namely--seeds, sugar, and agricultural produce turnovers--increased the exports of these commodities to a total sum of over 51 million foreign exchange zlotys. More and similar examples of the efficient work of the commercial people could be given. It brought ROLIMPEX additional foreign exchange revenue or savings calculated at many tens of millions zlotys. [Text] [Gdansk HORYZONT in Polish No 2, Feb 1980 p 46]

VARIMEX EXPORTS--Employees of the VARIMEX Foreign Trade Enterprise in Warsaw are effectively activating Poland's export exchange with many countries, socialist as well as capitalist. Contributing to this, i.e., is the acquisition of new domestic partners for collaboration on a cooperative basis

with foreign contracting parties and also cooperative domestic trade fairs organized by businessmen in Warsaw, Krakow, Bydgoszcz, Szczecin, and also in other voivodship cities. Owing to this, many of our State and cooperative enterprises last year undertook to produce for foreign customers elements which had not been manufactured heretofore. The value of this additional production surpassed 30 million foreign exchange zlotys last year. The establishment, at the initiative of VARIMEX employees, of [industrial] sector committees for bringing the cooperation of industry closer to our foreign trade, joint preparation of the development strategy of the pro-export sectors, and the establishment of priority export markets aided in achieving this success. The Sailors' and Longshoremen's Trade Union (ZZMiP) plant organization in VARIMEX is facilitating for the initiators the implementation of innovative undertakings which serve to expand the exports of our commodities and also to lower the costs of imported commodities for meeting the needs of industry and the people. [Text] [Gdansk HORYZONT in Polish No 2, Feb 1980 p 49]

SHIP EXPORTS--In the first half of 1979 the River Shipyard at Plock had to overcome the great production difficulties connected with removing the effects of last year's severe winter. The ambitious shipyard workers dealt with these difficulties swiftly and guaranteed a labor force for carrying out the tight plan for the construction of 47 various units (pusher tugs, barges, ferries, dump scows) with a total load capacity of approximately 38,00 tons. The crowning effects of the work force's concentrated efforts last year was the handing over on 28 December 1979 of two large specialized barges (their load capacity 3,000 DWT) to the Wroclaw NAVIGA Enterprise (exporter of inland marine equipment for foreign customers. Units of this type are used for dredging work on rivers and ocean coastal water regions, especially in Holland. On the list of last year's consignees for river craft produced in Plock were--in addition to Western German firms--also Swiss ship-owners. [Text] [Gdansk HORYZONT in Polish No 2, Feb 80 p 47]

GLUCOSE UNOBTAINABLE--Diabetics in Zielona Gora who are sent to the clinic for the so-called sugar curve test have to bring their own glucose because it is not possible to get it at the pharmacies or in stores. For these same reasons, it is impossible to carry out the request and the coupons for sugar do not extend to the purchase of medicinal glucose. [Excerpt] [Warsaw POLITYKA in Polish No 11, 15 Mar 80 p 16]

CSO: 2600

MEASURES TO ENSURE FULFILLMENT OF 1980 INVESTMENT PLAN

Bucharest REVISTA ECONOMICA in Romanian No 1, 4 Jan 80 pp 8-9

[Article by Gh. Ruscanu, Investments Bank: "Concentration of Forces for Commissioning of New Investment Facilities"]

[Text] The vast investment program for 1980--the value of which has risen to 244.5 billion lei, which is more than was invested during the entire 1951-1960 [sic] Five-Year Plan--is designed to ensure the commissioning of 670 new, relatively important production facilities and over 245,000 apartments and the commencement of work on more than 4,000 new facilities--of which 500 are decisive for the economy--which will ensure a better link with the next Five-Year Plan.

Full completion of this significant volume of work and timely commissioning of the new production capacities as well as the housing construction included in the plan for 1980 require an increase in the efficiency of the work carried on in the construction sites and realization of a new quality in the activity of all officials responsible for realization of investments. As pointed out by comrade Nicolae Ceausescu, in investments the increase in efficiency and, implicitly, the new quality will have to be reflected in a shortening of the time required for design and construction of the new facilities, in the commissioning of these facilities on time and ahead of time, and achievement of the parameters designed for the new production capacities and the housing construction on a rapid basis.

In order to achieve full realization of investments this year and throughout the present Five-Year Plan under proper conditions, considerable effort will be required in construction sites throughout the country to make up all the backlogs from 1979 so as to ensure continuity of the work in 1980 and to get ready for transition into the activity in the next Five-Year Plan.

Acceleration of the Rate of Work in All Construction Sites

The year 1979 represented an important stage in realization of the investment plan for the present Five-Year Plan. More than 560 industrial and agrozootechnical production facilities were commissioned in 11 months of

last year, with the greatest portion of them for customers in the machine building industry, the chemical industry, light industry, forestry and metallurgy, as well as in agriculture, etc. High rates of construction and a high degree of industrialization were achieved in numerous construction sites for priority investment facilities: development of sulfur production in the Calimani Mountains, the roughing-down and semifabricated product rolling mill at the Resita Iron and Steel Combine, the sheet rolling mill at the Galati Iron and Steel Combine, the alloyed steel pipe section at the Republica Plant in Bucharest, a new facility at the Tractorul Plant in Brasov, the Cluj-Napoca Heavy Equipment Combine, the Enterprise for Heavy Equipment and Machine Construction in Giurgiu, and others.

Although last year investments were realized and capital assets were put into operation in a volume higher than in preceding years (on 30 Nov 79, the investments realized since the beginning of the year were 15 billion lei greater than the realizations during the same period in 1978), in relation to planned goals there were some delays in construction of planned production capacities. The backlogs in commissionings were localized in particular in economic units subordinate to the following ministries: the chemical industry (164 significant facilities--totally or for a portion of the capacity), the machine building industry (156), agriculture and the food industry (105), forestry and construction materials (104), the metallurgical industry (74), and light industry (54).

Timely recovery of these backlogs--which is included in the 1980 plan--means that it is necessary to accelerate the deliveries of backlogged technological equipments so that they will be delivered sooner than contracted for by the machine building industry and the import enterprises. The most significant backlogs are localized in construction sites belonging in particular to investment sponsors in the Ministry of Metallurgy and Machine Building. For the most part, such equipment comes from suppliers in the Ministry of the Machine Building Industry: the Heavy Machinery Enterprise, the Machine Enterprise for Chemical Equipment, and the 23 August Plant in Bucharest, the Unio Plant in Satu-Mare, and the Machine Enterprise for Mining Equipment and Machinery in Baia Mare, the Machine Building Enterprise in Bocsa, the Enterprise for Engineering Equipment in Buzau, and others.

In addition to the efforts to make up backlogs in these units, further efforts will also be required in those construction sites which last year accumulated significant volumes of uninstalled equipments. This includes such sites as: the Cement and Limestone Factory in Medgidia, the Polyester Fiber and Granules Unit in Cimpulung, the Brazi Refinery, the Zalau Pipe Enterprise, the Victoria Plant in Calan, the Special Steels Combine in Tirgoviste, the Galati Iron and Steel Combine, the Jilt Lignite Quarry, and others.

Increased Effectiveness in Providing Documentation and Technological Equipments

More effective activity which responds to a much greater degree to the requirements posed by fulfillment of the investment goals for 1980 will have to be carried on in the direction of providing technical construction documentation and technological equipments. In this respect, steps have been taken and steps will have to continue to be taken to see that there is an intensification of efforts in order to achieve the following:

A. Provision to builders of the construction details and work estimates for the investment facilities which are continued from 1979 and, on the other hand, provision of the technical-economic documentation for the more than 4,000 facilities scheduled to be started in 1980. Action must be expedited, since as of the beginning of December 1979 the construction documentation had been provided for only 74 percent of the volume of construction-assembly work which was to have been executed under contract during 1980--an unsatisfactory stage if it is kept in mind that proper organization by the builder of his supply system for the construction sites and concentration of the labor force, construction equipments, and transportation equipment at the work location can be achieved only if there is complete documentation for the work to be performed.

It is true that some ministries and people's councils have turned over 85-90 percent and even more of the construction documentation to the builders. However, the fact is equally true that there are some investment plan sponsors which have not given sufficient attention to the problem of providing construction details and work estimates on time, which is one of the key problems for launching 1980 investments under improved conditions (Table No 1).

Table No 1. Proportion of Construction Details and Work Estimates Turned Over to Builders on 1 Dec 79 in Relation to the Volume of Construction-Assembly Work Under Contract Included in the 1980 Plan

<u>Investments Sponsors</u>	<u>Degree of Provision</u>
Ministry of Forestry and Construction Materials	40.8
Ministry of Agriculture and the Food Industry	58.8
Ministry of Domestic Trade	59.1
Ministry of Education and Instruction	59.6
Ministry of the Machine Building Industry	60.4
Mures County People's Council	18.1
Olt County People's Council	34.8
Cluj County People's Council	68.4
Botosani County People's Council	70.6
People's Council of Bucharest Municipality	69.8

During this period, sustained efforts will be required by customers, sponsors and designers in expediting preparation and analysis of technical-economic documentation for the new facilities in 1980 in the technical-

economic commissions and councils and in expediting presentation of this documentation for coordination, approval and confirmation. In some cases, the stages of such documentation are not correlated with the requirements for commencement of work (Table No 2). Priority emphasis must be put on acceleration of the preparation of documentation for some people's councils and for units within the Ministry of Agriculture and the Food Industry, the Ministry of Forestry and Construction Materials, the Ministry of the Machine Building Industry, the Ministry of the Chemical Industry, and the Ministry of Transportation and Telecommunications for facilities that are scheduled for the first half of this year.

Table No 2. Stage of Preparation (as of 1 Dec 79) of Technical-Economic Documentation (Construction Design) for Facilities Scheduled To Begin in 1980

<u>Stage of Preparation of Documentation</u>	<u>Approval Authority</u>		
	<u>Decree</u>	<u>Sponsor</u>	<u>Enterprise and Central</u>
Preparation of construction design not started	26.0	14.0	28.0
Construction design being prepared	41.8	16.9	26.1
Construction design being analyzed in the technical-economic commissions and councils	18.1	2.3	4.1
Construction design in the coordination organs	7.3	4.7	10.6

B. Complete contracting for the amount of equipments needed for the annual 1980 investments in strict correlation with the schedules for spacing out investments and equipment deliveries and adherence--in executing the contracts--to time schedules and other delivery conditions. Actions in this respect must be intensified because as of the beginning of December 1979 only about 80 percent of the technological equipments needed from domestic suppliers in 1980 had been contracted for. The following are below this average: the Ministry of Transportation and Telecommunications (which has contracted for only 15.4 percent of the technological equipment from suppliers within Romania for 1980), the Ministry of the Chemical Industry (63.7 percent), the Department of the Food Industry (73.2 percent), the Ministry of the Metallurgical Industry (77.9 percent), the Ministry of Electric Power (78.1 percent), and others in units in which there is a need for definitive urgency in the efforts in this respect.

Objective: Preparation of the Investment Plan for the 1981-1985 Five-Year Plan

During the period 1981-1985, an investment volume of 1,300-1,350 billion lei will have to be realized. This figure is higher than the volume realized during the years 1951-1975 in total and is more than 20 times greater than the figure achieved during the 1951-1955 Five-Year Plan. Through the method of locating the new industrial and agrozootechnical facilities in the territory, the conditions will be created within each county for realization of a total production of at least 70,000 lei per inhabitant and an employment rate for the labor force of a minimum of 400 people per 1,000 inhabitants. Realization of an investment program of such scope presupposes significant qualitative increases in the activity of all participants in the investment process through the following:

- more thorough justification by plan sponsors of investment facilities included in the Five-Year Plan by means of presentation of justification notes based in large part on deeper studies on long-term development of the branches, sub-branches or product, on market studies, and on forecasts with clarified technologies, having specified the designers, builders, and equipment suppliers;
- emphasis by customers and investment sponsors on activities for getting ready for realization of annual investment plans through preparation and turning over to builders of the technical-economic and construction documentation for facilities included within the plan within time frames which will permit good organization of the construction sites;
- substantially shortening the process of preparing, coordinating and approving technical-economic documentation and the other approvals and conditions for strating the investment facilities through raising the qualitative level of the designs and the calculations of technical-economic indicators and through reduction and simplification of the contents of the documentation;
- sounding out the market and ordering and contracting for technological equipment in the period prior to the plan year in close correlation with the schedules for spacing out investments and equipment deliveries. Strengthening contractual discipline and quality control on the part of suppliers of equipment and construction materials through strict adherence to delivery periods in contracts and to other conditions on which exploitation of the equipment depend, and improvement in technical-material supply to construction organizations;
- increasing the degree of industrialization and mechanization of the construction activities in the construction sites.

Full and rhythmic fulfillment of the goals set by the investment programs through the organizational and creative effort of all officials represents a task of great responsibility, a premise which ensures that the entire nation will more rapidly be set on the path to progress.

EXTENDED USE, RECYCLING OF MACHINE PARTS, EQUIPMENT

Bucharest REVISTA ECONOMICA in Romanian No 1, 4 Jan 80 pp 6-7

[Article by Marin Popescu, Institute of Finances, Monetary Circulation and Prices, and Ion Popescu, University Assistant, Academy of Economic Studies: "Reduction of the Nation's Efforts in Procuring Raw Materials and Energy Implies Utilization of a Significant Source of Savings: Reuse of Machine Parts and Equipment Withdrawn from Use"]

[Text] As pointed out in the documents of the Twelfth Party Congress, realization of an advance to a new quality in all sectors of social-economic activity has as a significant component achievement of a substantial increase in the volume of production achieved for each 1,000 lei invested in capital assets and a reduction in the cost of production obtained by each machine and piece of equipment in the fabrication process. As indicated by comrade Nicolae Ceausescu, in achieving these goals, "We must give greater attention to the reconditioning of subassemblies, machinery and equipments. We will have to establish norms in this respect -- just as is done in other countries -- providing for the reconditioning of parts on a repeated basis and for reuse of these parts. On a practical basis, there are no subassemblies which cannot be reconditioned and reused at least once or twice. This also leads to a great savings in materials, special steels, energy and labor and facilitates real solution of supply problems."

The State Council recently adopted a decree concerning recovery and utilization of reusable material resources through which they established the responsibilities and authorities assigned to the ministries, people's councils and socialist state and cooperative units for recovery and full utilization of all reusable material resources, for ensuring recoveries through the plan and reintroduction into the economic circuit of old raw materials and reusable materials and products, for creation of an industry for reconditioning of parts, subassemblies and products, and for unitary organization of this activity, as well as for enlistment of the entire population in the recovery and reuse program. In order to realize this especially significant goal and in order to extend the life expectancy and degree of use of the capital assets and reduce the cost of providing and using the technical base of production, multiple actions are underway in enterprises throughout the nation involving the reconditioning

and reuse of subassemblies and parts of certain machinery, avoidance of premature wearing out of equipment through rational operation and maintenance of such machinery, achieving an increase in the quality of the repairs made, and increasing the skill level of the labor force.

The Requirements of Extending the Life Expectancy of Equipments

Extending the life expectancy of capital assets is a principal factor in reducing the efforts presupposed for ensuring the volume of capital assets necessary for the national economy. And this is not all. Consideration must also be given to the fact that in order to carry on all production under conditions of high economic effectiveness it is necessary for the life expectancy of the capital assets to ensure a certain degree of "stability" in the technological processes which will permit their utilization over a longer period. In this way there is an increase in the proportions of series fabrication and a reduction -- per unit of product -- in research and design and adaptation of the human factor to the requirements posed by the specific nature of the respective technologies. At the same time, we ensure avoidance of reprocessing of metals at relatively short intervals of time and, respectively, avoidance of the expenditures presupposed by this process.

Consideration of these aspects brings out even more clearly the favorable implications of extending the life expectancy of capital assets (and also the products which will play a fixed intermediate role in the customer units). This is likely to contribute to the stability and even the diminution in time of the prices per parameter unit of machinery, thus ensuring a high efficiency in the use of equipment in the fabrication process. It is also obvious that extending life expectancy also requires action not only in the actual exploitation phase of the fixed assets, but also in particular in the conception and design phase of such fixed assets.

Of course, the stability of technologies or the conception of products must not be absolutized since the requirements of the contemporary technical-scientific revolution presuppose modification of technical-construction and functional performances of equipments and machinery in accordance with the needs of the national economy and the evolution of technical progress. The objective process necessary for renewal and diversification of production at the producer level (and also the provision of this production to the customer) must, however, be conceived of in such a way that there is a combination wisely made of the new technologies -- necessary for fabrication of parts and subassemblies with a greater frequency of physical wear at higher parameters -- with existing technologies. Exclusive replacement of mobile subassemblies is required because it is possible to ensure operation of the aggregates at normal (or higher) parameters since the fixed parts -- which make up a high percentage of the weight of machinery and equipment -- show a resistance and operational reliability over a much longer period of time.

In general, mobile parts have a much higher degree of wear as a result of the friction which occurs during operation. In contrast to this, the fixed parts, which are much less stressed during operation, can be used in an incomparably greater number of cycles. The less active parts and subassemblies represent a high percentage of the total weight of the capital assets and reproduction of such items requires considerable expenditures of raw materials and energy. Therefore, maximum rational management not only of the existing technical-material base, but also of the material and labor resources means that we have to have an overall strategy which has the following as elements:

- a) More complete utilization of the fixed parts incorporated in machinery, equipment and installations in our national economy, an extension of the life expectancy of capital assets through periodic replacement of the parts under more intensive stress during the time they are in use, reconditioning and reuse of some subassemblies, etc. The importance of this factor increases considerably in the case of groups of complex equipment for which the casting and processing require high specific consumptions of raw materials and energy. It is necessary for the fixed parts of machines, equipments and installations to be kept in use until all possibilities have been exhausted for extending their efficient operation;
- b) Improving the present system of determining the normal operational life expectancy of capital assets by taking into consideration to a more significant degree differentiated periods of utilization for systems and their mechanisms;
- c) Solving the problem of producing spare parts at the necessary level, as well as the problem of recovering spare parts. Within this framework, it is necessary to nominalize the production of spare parts through the plan, as well as to intensify programs for recovery and reuse of these parts;
- d) Good maintenance and operation of capital assets, increasing the skills of the people who use them so as to prevent premature physical wear of the assets, expanding repair activities, and increasing the quality of such repair work.

A Readily Apparent Contradiction: Technical Progress -- Extending the Life Expectancy of Machinery

Obviously, after a certain time, as a result of the evolution of science and technology, extending the life expectancy of machinery, equipment and installations -- which is determined in essence by the resistance and operational reliability of the fixed parts -- can enter into contradiction with some new products with superior characteristics which have been developed on the world level. Under the conditions of extending the durational use of the fixed parts of equipments, preventing this contradiction and solving it require continued improvements in the products in use in accordance with the exigencies of technical progress.

In this context, economic reason requires that the fixed parts of equipments and installations -- which, through the system in which they operate, have a much greater duration of use than the product overall -- be produced in such a way as to permit rapid modernization at minimal cost of the subassemblies which wear out more rapidly and of the capital asset itself. On this basis, modernization of capital assets can be accomplished through improvement of some of the active parts and subassemblies (which amplifies the useful effect of the use of work equipment), parallel with the retention in production or the reconditioning of subassemblies and parts which do not contribute substantially to realization of the functional performances of the machinery and installations. For instance, modernization of the U-26 and U-27 tractor engine can be achieved by replacing the auxiliary engine using spark ignition with an automated starter. Owing to the possibilities for continuous utilization of parts and subassemblies with great longevity in operation (the engine block, cylinder head, frame, connecting gears, transmission, chassis, etc.), application of such solutions leads to an increase in their technical level at minimal cost. Keeping in mind the number and high quality of tractors which are now working and which will work in our agriculture, it can be seen that in this way it will be possible to cut the expenditures necessary for mechanized execution of work.

Considering the fact that, in general, the fixed parts represent a high percentage of the weight of the equipment, it can be seen clearly that establishing the life expectancy and operational life of machinery and equipment as a function of the technical criteria of durability and operational reliability of the fixed parts will provide significant savings of metal and energy on the total material production level. The existence of a significant volume of machinery, equipment and installations and also the diversification and renewal of products during the 1981-1985 Five-Year Plan create premises for efficient reconditioning and reuse of some impressive quantities of parts and subassemblies. It must be emphasized that this system is practiced with great efficiency.

In France, certain factories have specialized in a new type of production, i.e., they take machine tools which have become obsolete, they modernize them, and they adapt them to the performances which have been achieved at the present time; in this way, production costs are cut by two-thirds.

In Romania, at the Grivita Auto Repair Enterprise in Bucharest, the volume of "short usage" spare parts has been substantially reduced as a result of the programs for reuse of such parts. In 1980, the special workshop which is to be created in the unit will achieve a production of 25 million lei from reconditioning. The necessity for extending part reconditioning activities into all fields -- both through the creation of new units and through the diversification of the subassemblies and parts included in this program -- is convincingly supported by the high economic effectiveness of these processes.

A conclusive example in this respect is shown by the special advantages gained in reconditioning crankshafts for different auto transport equipment compared with reproduction of the crankshafts: the cost of reconditioning these crankshafts, that is, metallizing the worn portions, is only 5 percent of its total production cost. It can therefore be seen that for the approximately 100 crankshafts which the Grivita Auto Repair Enterprise can recondition annually there are savings in materials and handling of more than 500,000 lei approximately.

Also illustrative of the significant effects obtained per unit of effort expended in the reconditioning of subassemblies is the fact that at the Cimpulung Muscel Machine Enterprise, at a cost of 20,000 lei, they modernized a lathe -- which was completely amortized -- in 1978 through reconditioning and reuse of parts and subassemblies, in this way achieving an increase in labor productivity of 300 percent and a savings of 115,000 lei in handling.

Proper integration of reconditioned subassemblies and parts into modernized products presupposes that during the process of fabricating such equipment consideration is given to the long-term evolution of the technical, design and functional level of the machinery, equipments and installations. At the same time, extending the process of type standardization of machinery, equipment and devices is of special importance. The same effect is gained by extending the production and utilization of type standardized subassemblies in modernization of products which exist in fabrication and operation.

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7 May '80
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